KA’U COMMUNITY ASTHMA MANAGEMENT PROGRAM

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By

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DEDICATION

The Ka’u Community Asthma Management Program is dedicated to those who participated in this project as well as those who share in the same responsibilities of caring for adults with asthma. The project has been inspired by my husband, Tilden P. Miguel and my children, Tiara C.C. Miguel and Dr. Tilden-Christen M. Miguel who all suffer from asthma. It is my sincere hope that this project will help others to better their asthma management, improve the quality of their lives, and serve as an example to improve asthma management in their communities.
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ABSTRACT

Asthma has debilitating effects which impact the mental, physical and socio-economic aspects of the population. The Ka’u district has the highest number of adults who have asthma. The project was guided by the ACE Star Model of Knowledge Transformation complimented by community participatory approach. Literature review and synthesis revealed that community-based asthma education and asthma self-management that includes self-efficacy, an asthma action plan, journal writing, and the use of peak flow meters are the most effective interventions for asthma control. The objective of the project was to determine whether community-based asthma education and self-management including: self-efficacy, an asthma action plan, journal writing, and use of peak flow meters, reduces asthma exacerbations.

The Ka’u Community Asthma Management Program (KCAMP) is an evidence-based practice project designed to improve the practice of management of asthma. One-on-one and group asthma educational teaching and skills training sessions were provided to participants. The program sessions were held in Na‘alehu, Hawai‘i at Hui Mālama Ola Nā Ōiwi, at the Hawai‘i County Economic Opportunity Council Center, and in the residences of the participants.

Fourteen adult residents with asthma from the Ka’u District, ages from 28 to 75 years old participated in the program. There were 64% (n=9) females and 36% (n=5) males. The racially diverse group included ten Hawaiians, three Asians, and one Caucasian.

Participation in the program resulted in the increase of asthma knowledge 93% (n=13); ACT scores increased by 100% (n=14); MiniAQLQ scores increased by 93% (n=13); peak flow measurements increased by 86% (n=12); FEV1 levels increased by 64% (n=9); and, 71% (n=10) choosing asthma education as the most helpful intervention.
This project increased participants’ knowledge in asthma, decreased asthma exacerbations, prevented hospitalization, provided participants confidence to manage their asthma and increased their quality of life. The key implication for practice is to promote KCAMP as a community based asthma self-management program. The barriers and challenges of the project serve as exemplars for others the incentive to create plans to overcome these obstacles. This project serves as a form of asthma self-management program in the community setting.
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CHAPTER 1. EXECUTIVE SUMMARY

Introduction

**Background/Problem of the project.** Asthma can have debilitating effects which can impact the mental, physical and socio-economic aspects of the population. In the state of Hawaii, 14.3% of a total population of 1,404,054 has asthma (United States Census Bureau, 2014). Of the 14.3%, 18.9% is comprised of adults diagnosed with asthma and reside in the Ka’u district on the Big Island of Hawai’i (State of Hawai’i Department of Health, 2014; Hawai’i Behavioral Risk Factor Surveillance System (HBRFSS) (HBRFSS, 2014).

**Conceptual framework.** The ACE Star Model of Knowledge Transformation was chosen for implementing a change project in asthma management for the community of Ka’u with the goal of reducing asthma exacerbations. The ACE Star Model which consists of a five pointed star represents five major stages. The first stage is discovery of primary research, followed by the stages of evidence summary, translation, integration, and evaluation (Stevens, 2013).

**Literature review and synthesis.** Community asthma education and self-management was found to be the most effective strategies in managing asthma. Community asthma education can improve outcomes, help with fewer acute exacerbations, reduce emergency room visits, and improve productivity and medication adherence. Recent publications include a review of the literature (Andrews, Jones & Mullan, 2014), level II studies (Chen, Sheu, Chang, Wang & Huang, 2010; Jones, 2008; Krieger, Takaro, Ling-Song, Beaudet & Edwards, 2009) and a level V study (Federman et al., 2013). Asthma self-management such as self-efficacy, use of asthma action plan, journaling and use of peak flow has been shown to improve outcomes, produce fewer acute exacerbations, reduce emergency room visits, increase productivity and compliance.

**Innovation/Objectives.** The DNP project objective is to determine whether community-based asthma education and self-management including: self-efficacy, an asthma action plan, journal writing, and use of peak flow meters, reduces asthma exacerbations in the community of Kaʻu.

**Methods**

**Design.** The Kaʻu Community Asthma Management Program (KCAMP) is a quality improvement (QI) and evidence-based practice (EBP) project. It is a community-based intervention designed to improve the practice of asthma management.

**Practice change description.** Based on literature review, Project KCAMP (a community educational and asthma skills training sessions) were developed to improve asthma self-management and to reduce asthma exacerbation, number of office visits, and number of emergency room visits. The program’s sessions were orientation, asthma education, asthma self-management skill, one and three post-implementation or follow-up.

**Setting and sample.** The asthma program’s activities and collection of program data took place at the Naʻālehu, Hawaiʻi office of Hui Mālama Ola Nā ʻŌiwi, Naʻālehu Hawaiʻi County Economic Opportunity Council Center (HCEOCC), and in the participants’ residences. Adults with asthma, ages 18 years old and above, living in Kaʻu were recruited to participate in the asthma management program.

**Data collection.** Data were collected through group and one-on-one individualized sessions. Demographic survey, interview questions, journal and pre and posttest on asthma
control test (ACT), mini asthma quality of life questionnaire (MiniAQLQ), asthma skills knowledge questionnaire, and asthma educational knowledge were used to collect the data. Peak flow and forced expiratory volume measurements were also gathered.

Results

Description of Participants. Fourteen adults (n=14) participated in the KCAMP program for five months, from August 2015 to December 2015. All sample reported diagnosed with asthma. The ages were 28 to 75 years old. There were 64% (n=9) females and 36% (n=5) males. All participants lived in the Ka’u District. Seventy-two percent of Hawaiian descent (n=10), 21% were Asian (n=3), and 7% was Caucasian (n=1).

Data analyses findings. In one month and three months’ post-implementation there was an increase from baseline in participants’ asthma knowledge, ACT and MiniAQLQ scores and FEV1, and peak flow measurements. Change in asthma behaviors showed improvement in asthma self-management, decreased in asthma exacerbations, no hospitalization, no emergency visits and decreased in doctors’ visits were observed during the program. At the end of the program, 100% (n=14) of the participants reported asthma were controlled, their activities increased, they were aware of environmental factors and improved their breathing, tasting, and singing.

Discussion

Interpretation of results. The combination of asthma community education and self-management using asthma skills such as knowing and eliminating asthma triggers, using asthma action plan, using peak flow and spacers showed positive benefits for the participants of the project. Evidence showed that the program increased the participants’ knowledge in asthma,
decreased asthma exacerbations, prevented hospitalization, provided participants confidence in managing their asthma and increasing their quality of life. Through the participants’ oral, interview and journal reports they had a greater understanding of their asthma, felt in control of their well-being, and showed evidences of control through their ACT, MiniAQLQ, FEV1 and peak flow measurements and scores.

The positive results of this project reflect the concerted efforts of the Hui Mālama Ola Nā ‘Ōiwi staff and volunteers, and the guidance and collaboration of outside advisors, pharmacy doctor, asthma guest speakers, and the doctoral advisors. All KCAMP participants and their contributions were also vital in making this project a success.

**Implications.** The implication of the project was to promote the KCAMP to other communities to provide a community asthma self-management. The potential for decreasing asthma exacerbations, emergency room visits and hospitalizations, decrease health costs and improving the quality of life for adults with asthma and their families with KCAMP merits further adaptation of the program in the community setting.

**Limitations.** The results of the project included a few limitations. The impact of the practice change may have been limited by a small sample size. The short period of time allotted for the implementation phase may not have allowed adequate time for fully engaging the participants, and the use of two untested instruments may have limited the interpretation of the findings.
CHAPTER 2. PROBLEM

Introduction

Asthma is a serious health condition that affects many people throughout the world. The disease is characterized by recurrent attacks of breathlessness and wheezing which vary in severity and frequency from person to person. Asthma has negative effects on its sufferers causing increases in health care costs, lost productivity, reduced participation in activities, and decreased quality of life. Despite many scientific advances in understanding asthma and creating plans to improve the control of asthma exacerbations, asthma’s prevalence among adults continues to rise. It is important to examine the current asthma management practice among adults at the community level, and to create an evidence-based asthma management practice that is adapted to the needs of the local population. It is here where an effective asthma management practice can begin to lessen the global burden of the disease.

This chapter provides a brief overview of the project; presents the Academic Center for Evidence-Based Practice (ACE) Star (Stevens, 2004) conceptual model which will be used to guide the project’s implementation process; describes the project’s background which shows the extent of asthma at the local, national and international levels; and presents a literature synthesis of asthma interventions for managing the condition. Also provided is an outline of the project’s objectives and a summary of the project.

Background/Problem of the Project

The World Health Organization (WHO) estimates that 235 million people currently suffer from asthma (WHO, 2014). In 2013, the Centers for Disease Control and Prevention
CDC) reported that in the United States asthma affects an estimated 18.7 million adults, ages 18 years and older.

Asthma can have debilitating effects which can impact the mental, physical and socio-economic aspects of the population. The mortality among patients that are hospitalized for asthma exacerbations accounts for one-third of all deaths in the United States from asthma (Krishnan et al., 2006).

In 2007, the CDC reported the estimated total cost for asthma-related medical expenses at $50.1 billion per year; $3.8 billion was accounted for loss of productivity from missing school or work days (CDC, 2011a). In 2010, asthma caused 3,404 deaths, 439,400 hospitalizations, 1.8 million emergency room visits, and 14.2 million physician office visits (CDC, 2011a).

In the state of Hawai’i, 14.3% out of a total population of 1,404,054 has asthma (United States Census Bureau, 2014). Of the 14.3%, 18.9% is comprised of adults diagnosed with asthma and reside in the Ka’u district on the Big Island of Hawai’i (State of Hawai’i Department of Health, 2014; Hawai’i Behavioral Risk Factor Surveillance System (HBRFSS) (HBRFSS, 2014). The HBRFSS 2013 results reported adult with asthma in Hawai’i county was 149, 215 with 44,134 who live in the Puna and Ka’u districts (Nguyen & Savail, 2013, p. 77).

Conceptual Framework

A conceptual model is essential for transforming asthma management research into nursing practice. The ACE Star Model of Knowledge Transformation in Figure 1 is a graphic representation of a simple yet comprehensive approach for converting evidence into practice (Stevens, 2013). This model was chosen for implementing a change in asthma management for the community of Ka’u with the goal of reducing asthma exacerbations.
Stevens (2004) developed the ACE Star Model which consists of a five pointed star illustrating how information is transformed. Each point of the star represents five major stages. The first stage is discovery of primary research, followed by the stages of evidence summary, translation, integration, and evaluation. The ACE Star Model is also influenced by Imogene King and continues to evolve in combining concepts of knowledge transformation with elements of communication, mutual goal setting, and systems (Steven, 2013). Stevens (2013) also wrote that the ACE Star Model is used by hospitals across the nation in guiding their journey to excellence which forms a foundation for developing workforce competencies, organizing projects, and employing evidence-based practice (EBP) in clinical settings.

Point 1, discovery of research represents the first step which is a knowledge-generating stage. In this stage, new information will be discovered through research methodologies and scientific inquiry. This stage guides the investigation of asthma as associated with EBP, including summarizing asthma management evidence, clinical guideline development and uptake, culture and outcome measures.

Point 2, evidence summary is the synthesis of all available knowledge. It involves synthesizing literature on asthma interventions, management, and practices. This stage includes investigation of previous scientific work. To provide a client-centered asthma intervention, a community need assessment will be also conducted in this stage through a survey and the use of the Asthma Control Test (ACT) (Nathan, et al., 2004; Zhou, Ding, Lin & Yin, 2009).

Point 3, translation into guidelines, is the practice of transforming knowledge into action which is often referred to as development of evidence-based clinical practice guidelines, combining the evidential base with expertise to extend recommendations. At this stage the best
evidence-based asthma practices will be combined and presented to clients as practice guidelines.

Point 4, practice integration is alignment of current asthma practices with the asthma evidence practices for reducing asthma exacerbations among adults 18 years and older. It also involves changing individual, organizational or community practices through formal and informal channels. In this stage broad participation, engagement and collaboration with active stakeholders from the community will be needed. The use of community-based participatory approaches (CBPA) is important to engage the most trusted members of the community (Croisant & Scott, 2014; Tse, Palakiko, Daniggelis & Makahi, 2015; Virginia Department of Health, 2014). Through the CBPA, community leaders in Ka’u will be empowered to promote asthma interventions and to help steer the project towards achieving its goals.

Point 5, process, outcome evaluation, is the final stage which is knowledge transformation. In EBP, a broad array of endpoints and outcomes are evaluated. This includes assessments on the impact of EBP on patient health outcomes, provider and patient satisfaction,
efficacy of treatment, economic analysis, health care policy and sustainability of the project. In this stage the project’s role in reducing asthma exacerbations, in decreasing asthma attacks, and/or its lack of effectiveness will be evaluated.

**Triggers at DNP Project Site**

Point 1, discovery of research. Managing asthma is an important issue in the Ka’u community. It is one of the selected health behavioral risk factors (HBRFSS, 2014; State of Hawai’i Department of Health, 2014). The project triggers for asthma management are problem-focused.

The Ka' u District is an area that is prone to sulfurous air pollution called, “vog” from the ongoing eruption of Kīlauea volcano (Longo, et al., 2010). Chow et al. (2010) reported that Ka'u district, is 50 miles southwest and downwind of Kīlauea's degassing vents, is chronically exposed, with ambient concentrations of SO2 of ∼30 ppb and PM 2.5 of 10–15 ug/m3. Vog can trigger asthma attacks (Hawai’i State Department of Health, 2011).

Informal interviews conducted with community members, the parents of asthmatic children, and with asthmatic adults revealed that they were unaware of an asthma action plan, had no asthma management education, were unfamiliar with the use of spacers and peak flow meter, and, did not adhere to treatments. Access to healthcare is also a contributing factor. Although the Ka’u district has a hospital, this facility is mainly for long-term care patients, and can only provide immediate emergency care. Patients needing additional respiratory treatments after receiving initial care in the Ka’u emergency room are transferred to Hilo Medical Center which is approximately 60 miles away. This distance often separates families from the asthma patient.
Recognizing the impacts of asthma in Hawai‘i, the Hawai‘i State Asthma Control Program (HSACP) developed the Hawai‘i Asthma Plan to meet the needs of people who suffer from asthma throughout the state (HSACP, 2014; Hawai‘i State Department of Health, 2012). The Hawai‘i Asthma Plan’s goal is to improve the asthma management practices in the emergency departments, in physician’s offices, and in schools. The Ka‘u District, which has the highest number of people with asthma on Hawai‘i Island, did not have an existing asthma management program. The lack of programming which supports and educates people about asthma in Ka‘u contributes to poor asthma management. Therefore, the goals of this project were to reduce asthma exacerbations and improve healthcare outcomes using evidence-based practices of a community asthma management program.

**Literature Review and Synthesis**

**Point 1, discovery of research.** A literature search was conducted for the period ranging from 2004-2014, using the PubMed, CINAHL, and Cochrane databases. Search terms used were, asthma and adults, evidence-based asthma, asthma practices, asthma guidelines, asthma management, asthma interventions and community. Added key terms used were: English, and humans. There was a considerable amount of literature reporting on the need for improving asthma management worldwide. A total of 90 research articles dated from 2004 through 2014 were retrieved using the University of Hawai‘i at Mānoa Library’s electronic online resources. The abstracts were initially scanned in order to obtain a general background of each article, and then read carefully for appropriate inclusion in the literature matrix. The collection of articles was further narrowed down to those dated between 2007 and 2014 to include to current studies on asthma management. From these, 26 articles were chosen for the literature
synthesis. The Agency for Healthcare Research and Quality’s (AHRQ) database (AHRQ, 2014) was also searched for clinical practice guidelines (CPG) for asthma, using the key term “asthma management”. There were three CPGs chosen for the purpose of this synthesis review.

The Mosby’s Research Critique Form (2004) was used to critique the 26 research articles and the Appraisal of Guidelines for Research and Evaluation (AGREE) II instrument was used to evaluate the three CPGs (Brouwers et al., 2010). The Mosby Research Critique Tool (2004) has eight levels of evidence as represented in Figure 2.

![Figure 2. Mosby’s Level of Evidence (Mosby, 2004).](image)

The AGREE II instrument tool has six domains and ranked by using an assigned grading of 1 to 7. The six domains are: 1) scope and purpose, 2) stakeholder involvement, 3) rigor of development, 4) clarity of presentation, 5) applicability, and 6) editorial independence. The three CPGs were each assigned an overall quality ranking from 1 to 7. CPG 1 by Work Loss
Data (2013) ranked six, CPG 2 by Sveum et al. (2012) was also ranked six and CPG 3 by Michigan (2012) was ranked at 5.

Using the Mosby Research Critique Tool and the AGREE II instrument, the articles and CPGs were ranked as illustrated in Figure 3. Of the articles there was one meta-analysis, nine level II, three level III, one level V, four level VI, three level VII, one literature review, four systematic reviews, and three CPGs.

![Number of Reports Reviewed (n=29)](image)

*Figure 3. Number of reports reviewed and their level of evidence.*

**Point 2, evidence summary and synthesis of evidence by sub-concept.** Asthma management was reported as a health disparity worldwide. The ages of the participants in the research studies included in the synthesis were between 18 to 85 years old, living in the USA, Netherlands and United Kingdom. Global Initiative for Asthma (GINA) (2014) works with health care professionals and public health officials around the world to reduce asthma prevalence, morbidity, and mortality. This organization suggests strategies for asthma
management and prevention. GINA’s objectives are: 1) to increase awareness of asthma and its public health consequences, 2) promote identification of reasons for the increased prevalence of asthma, 3) promote study of the association between asthma and the environment, 4) reduce asthma morbidity and mortality, 5) improve management of asthma, and 6) improve availability and accessibility of effective asthma therapy (GINA, 2014). The publications reported on: Cost benefits, improvements for quality of life, increases in productivity, decreases in hospitalizations, and lowered mortality and morbidity.

**Instruments.** There was numerous screening, measurement and evaluation tools that were discussed in the publications. Among them were: 1) asthma control test (ACT) (Federman et al., 2013, level V), 2) Short Test of Functional Health Literacy in Adults (S-TOFHLA) (Federman et al., 2013, level V), 3) Common Sense Model of Self-Regulation (CSM) (Federman et al., 2013, level V), 4) Beliefs about Medications Questionnaire (BMQ) (Federman et al., 2013, level V), 5) Asthma Quality of Life Questionnaire (AQLQ) (Freitas, et al., 2014, systematic review), 6) Nijmegen Questionnaire (used to screen for the hyperventilation syndrome) (Grammatopoulou et al., 2011, level II), and 7) Spirometry Capnograph (Grammatopoulou et al., 2011, level II).

**Interventions.** The literature described numerous interventions aimed at managing and controlling asthma exacerbations. Among the interventions were: 1) asthma action plans, 2) asthma education, 3) asthma community management, 4) asthma apps, 5) air purifiers, 6) asthma websites, 7) breathing techniques, 8) diaries, 9) dietary modifications, 10) medication therapies, 11) exercise, 12) herbal therapy, 13) humidifiers, 14) inspiratory machines, 15) peak flow meters, 16) stress management, 17) recognizing and decreasing environmental triggers, 18)
journaling, 19) yoga, and 20) vaccinations. The literature synthesis resulted in a common theme, that asthma education, asthma self-management, and use of peak flow interventions provided the greatest results, and showed significant contributions to managing asthma and adherence to medications and treatments. The literature also demonstrated that community participation can provide support for individuals who have asthma in helping stay in compliance with treatments and medications.

**Asthma education.** Asthma education can improve outcomes, help with fewer acute exacerbations, reduce emergency room visits, improve productivity and medication adherence (Andrews, Jones & Mullan, 2014; Chen, Sheu, Chang, Wang & Huang, 2010; Federman et al., 2013). Jones (2008, level VII) states asthma self-management education can decrease emergency department visits and hospital admissions. Patients use fewer medications and have overall lesser dependence on rescue medications (Jones, 2008).

**Community-based asthma education.** A recent level III study (To, Cicutto, Naushaba, McLimont, & Beyene, 2008) and level IV study (To, McLimont, Wang, & Cicutto, 2009) demonstrated that the development and implementation of a community-based asthma education program and asthma care program can lead to risk reductions in exacerbations, symptoms, lowered use of urgent health services, and reduced productivity loss related to asthma. Level II research by Martin et al. (2009) demonstrated that community-based asthma intervention improved with asthma self-efficacy, self-perceived coping skills, and the quality of life for low income African American adults with asthma. Asthma education involving the community member is fostering a culture of support for health care providers in adopting evidence-based
practice and health care quality improvement (Tapp, et al., 2014; Pruit, 2011; To, Cicutto, Naushaba, McLimont, & Beyene, 2008; To, McLimont, Wang, & Cicutto, 2009).

It is also important that asthma education be written in different languages to educate people with limited proficiency in the English language. Wisnivesky, et al. (2012) reported that the inability to understand English was associated with poorer self-management and showed worsened outcomes among elderly patients with asthma. A systematic review of asthma education by Press, et al. (2012) revealed that asthma education provided by healthcare professionals appeared effective in improving the outcomes of asthma for minority populations.

**Self-management.** Evidence gathered from the literature revealed that self-management includes: 1) self-efficacy, 2) the use of an asthma action plan, 3) journaling, and 4) the use of peak flow meters. Asthma self-management can improve outcomes, produce fewer acute exacerbations, reduce emergency room visits, increase productivity and compliance to medications (Andrews, Jones & Mullan, 2014; Chen, Sheu, Chang, Wang & Huang, 2010; Federman, et al., 2013; Krieger, Takaro, Lin-Song, Beaudet & Edwards, 2009; Jones, 2008). A learner-centered adult asthma self-management program significantly improved the cognition, quality of life, and behavioral outcomes in the participants (Tousman, Zeitz, Taylor & Bristol, 2010). Wechsler (2014) engaged in a level VII review of current asthma guidelines and recommended that physicians establish a self-management program in partnership with and specific to each patient to monitor control and adjust medications accordingly.

- Self-efficacy - Increasing self-efficacy can be achieved through self-management of asthma. Learners can identify their own asthma triggers, act on these to manage their asthma symptoms which in turn improve clinical outcomes
Patients with asthma who shared in making treatment decisions were shown to have significantly better clinical outcomes in asthma-related quality of life, asthma health care utilization, use of rescue medication, lung functions, and in the likelihood of well-controlled asthma care (Tapp, et al., 2014; Wilson, et al., 2010; Kaya et al., 2009).

- **Asthma action plans** - A level I study by Dwamena, et al. (2012) demonstrated that it is necessary to have a client-centered asthma action plan that includes the patient beliefs, daily activities and preferences. Several works demonstrate that a written asthma action plan is essential, and should be developed partnership with the client; e.g., a literature reviews (Andrews, Jones & Mullan, 2014), level II study (Grammatopoulou, et al., 2011) and a level VII study (Pruit, 2011). According to Jones’s level II work (2008), persuasive evidence exists that one of the most important components of asthma education is a written action plan that provide the patient with some latitude in determining changes to their medication regimen. Furthermore, the level II study by Raju, Soni, Aziz, Tiemstra and Hasnain (2012) revealed that an asthma action plan was a validated tool for assessment and management of asthma. It accurately assessed patients' asthma control.

- **Journaling** - Evidence showed that keeping a diary or journaling can help identify onset and triggers of asthma attacks. Self-reporting and the use of journaling and diaries can increase adherence to medications. This was demonstrated in a
systematic (Marcano Belisario, Huckvale, Greenfield, Car & Gunn, 2013) and by Kliqler et al., 2011 in a level II study. Patients with asthma who participated in a randomized trial of a self-management intervention using journaling or written accounts of their asthma symptoms improved their adherence to medication therapy, e.g., a level II study by Janson, McGrath, Covington, Cheng & Boushey (2009).

- Peak flow meters - Literature showed that peak flow meters were a commonly used intervention tool that helped prevent asthma exacerbations, and were used as a tool to measure lung function after medication therapy. Peak flow monitoring (PFM) was recommended for all asthma patients and was routinely included in asthma management. Research studies by Grammatopoulou, et al. (2009) (level II) and Rahmati, Ansarfard, Ghodsbin, Ghayumi & Sayadi (2014) (level II) used PFM as an instrument to evaluate lung capacities of the participants after receiving an asthma intervention. Monitoring peak expiratory flow (PEF) values was an option detailed in the asthma action plan suggested by national guidelines (Global Initiative for Asthma, 2014). Peak flow meter use is also recommended by the Hawai’i State Department of Health (2012) for early detection of asthma attacks and early medication intervention. A systematic review by Marcano Belisario, Huckvale, Greenfield, Car & Gunn (2013) described the use of peak flow readings and peak flow variability to correspond with asthma self-management. In Jones’ study (2008) (level VII) study, participants were able to decrease severity of their asthma attacks by using peak flow measurements.
The literature review by Self, George, Wallace, Patterson & Finch (2014) reported that patients should be taught the proper way of using peak flow meters. The authors found that peak flow meters are only effective when patients were able to perform all the steps in using the peak flow meter. Evidence revealed that patients’ failure to inhale fully or exhale with maximum effort affected the results of their peak flow measurements. This study also suggested that clinicians help ensure correct use of PFM’s and to take accurate PEF measurements.

**CPGs in Asthma.** Work Loss Data Institute CPG (2013) recommended continued assessment and monitoring of asthma, provisions for self-management education, use of peak flow meters to help patients who have difficulty perceiving symptoms and a history of severe or moderate exacerbations, and development of an asthma action plan in partnership with the patient. The CPG 2 (Sveum, et al., 2007) recommended including the following for managing asthma: Use of an asthma action plan, asthma control tests (ACT), asthma education, use of peak flow meters, adherence to medication treatment such as Beta2-agonist and corticosteroids, and, vaccinations. Furthermore, the Michigan Quality Improvement Consortium (2012) recently released a CPG for asthma management for youths and adults. The guideline was based on the "2007 National Asthma Education and Prevention Program Expert Panel Report 3, Guidelines for the Diagnosis and Management of Asthma” by Sveum, et al., (2007). In CPG 3, the Michigan Quality Improvement Consortium (2012) suggested including the following for managing asthma: To assess impairment and risk of asthma severity, to include follow-up and step therapy up and down for asthma control, to provide patients asthma and environmental control education, and for persistent asthma to consult with asthma specialist at step 4 or higher and to consider consulting a specialist at step 3. The step approach for asthma management by
Michigan Quality Improvement Consortium (2012) were: 1) Step 1: Use short-acting beta2-agonist (SABA) as required, 2) Step 2: Use low-dose inhaled corticosteroid; alternative: cromolyn, leukotriene receptor antagonist, nedocromil, or theophylline, 3) Use low-dose inhaled corticosteroid plus long-acting beta2-agonist (LABA) or medium-dose inhaled corticosteroid; alternative: low-dose inhaled corticosteroid plus either a leukotriene receptor antagonist, theophylline, or zileuton, 4) Step 4: Use medium-dose inhaled corticosteroid plus LABA; alternative: medium-dose inhaled corticosteroid plus either a leukotriene receptor antagonist, theophylline, or zileuton, 5) Step 5: Use high-dose inhaled corticosteroid plus LABA; considering omalizumab for patients with immunoglobulin E (IgE)-mediated allergies, and 6) Step 6: Use high-dose inhaled corticosteroid plus LABA plus oral corticosteroid; considering omalizumab for patients with immunoglobulin E (IgE)-mediated allergies.

The overall appraisal of CPG 3 by the Michigan Quality Improvement Consortium (MQIC) (2012) was rated lower than the CPG 1 developed by the Work Loss Data Institute (2013) and CPG 2 Sveum, et al., (2007) because of the broad range of the target population’s ages, providing non-specific adult asthma interventions. MQIC’s guidelines were replicated from CPG 2 (Sveum, et al., 2007).

Quality of evidence. The national practice guidelines, non-research literature, and expert opinions were included in the literature synthesis to investigate the management of asthma. The quality of the research articles ranges from level VII to level I, systematic reviews and CPGs. The updated CPGs provided a historical overview of asthma management, supporting new research and asthma practices.
The research questions and designs of the articles were clearly defined. Data analysis of the articles were provided in tables and figures providing a graphic representation that was clear and easy to understand. Analyzing the internal validity of the articles, most of the articles were fair or did not meet all criteria, but were judged to have no fatal flaws that invalidated the results. Statistical tests that were conducted in each study were clearly explained by the authors and were appropriate.

**Quantity of evidence.** The quantity of the samples or participants of the study ranged from 21 in a research study by Tousman, Zeitz, Taylor & Bristol (2010) to 1,408 participants in the research study by To, Cicutto, Naushaba, McLimont & Beyene (2008). The study samples were generalized and had an adequate number of adequate samples for use in power analysis. In terms of the quantity of evidence, the literature provided enough studies and evidences to make a practice change in asthma management.

**Consistency of evidence.** Although low health literacy has been linked to poorer asthma outcomes (Federman et. al, 2013) (Level V), the literature reviewed was inconsistent in details regarding racial differences and in subjects with English as a second language. Another discrepancy was found in literature on the use of mobile phone messaging to help manage chronic health conditions. Car, Gurol-Urganci, de Jongh, Vodopivec-Jamsek and Atun (2012) conducted a systematic review on mobile phone messaging, and reported that this practice was an effective intervention in self-management. However, a later systematic review performed by the same authors (de Jongh, Gurol-Urganci, Vodopivec-Jamsek, Car & Atun, 2012) reported that mobile phone messaging helped in supporting self-management of long term-illness, however,
showed gaps between mobile phone messaging’s benefits and the long-term effects, acceptability, costs and risks of this intervention.

Although the literature reviewed contained a few inconsistencies, majority of the articles studied showed uniform results. The studies indicated evidence for patient asthma education programs, promoted self-management, and endorsed peak flow meter use, which are necessary components for positive asthma management outcomes. These interventions demonstrated clinical and statistical improvements in asthma control. The scientific discoveries written in literature can lead to improved prevention and the treatment of asthma.

**Weaknesses, gaps, limitations.** Weaknesses of each research article were identified. The numerous quantities of interventions in a few of the articles made it challenging to identify how each intervention influenced the results and outcomes of the study. Researchers that focused only on provider behavior frequently did not collect data on patient outcomes, limiting the conclusions that could be drawn about the relative effect of the intervention. There was a lack of RCTs for older adults ages 70 and over. There was a lack of culturally sensitivity in asthma teaching approaches and the use of language and communication techniques. There is a lack of geographically focused research on the different population groups in the United States to acknowledge the barriers for patients with poor health literacy skills. Nearly all the literature reviewed mentioned using peak flow meters, but there is a lack of current systematic reviews or individualized research of its effectiveness. The literature is also lacking in research on asthmatic adults in Hawai’i. The increasing number of adults being diagnosed with asthma in Hawai’i is a concern. Further asthma surveillance, research, and efforts by clinicians to decrease the asthma disparities among the different communities should be developed. The literature also
revealed a lack of qualitative research studies on the effects of multiple asthma interventions. While there are many studies on asthma, each article presented different interventions. Key limitations reported by the researchers were unknown factors contributing to self-management practices in adults.

Despite the evidence provided by the Hawai‘i State Asthma Control Program (2014), recommendations by researchers, and policy sanctioned by health care authorities, the translation of effective asthma management in practice remains poor. The evidence discovered through this literature review warrant a DNP project that addresses the prevention of asthma exacerbations based on the best practices found in the literature.

**Summary of literature review and synthesis.** The objective of determining the best research evidence available on adult asthma management for this EBP project was accomplished through literature synthesis. The synthesis included all levels of evidences to draw on the best asthma EBPs that can be implemented in a DNP project for asthma. The existing CPGs were helpful in literature synthesis. Despite the abundance of positive evidence of asthma interventions for reducing the health impacts of asthma at both the individual and community levels, there are inconsistencies and limitations. Inconsistencies were present in the research designs used, in as much as research was lacking in terms of health literacy, and interventions involving populations with cultural and linguistic differences. Various interventions, such as the use of phone messaging as a self-management intervention tool for asthma control resulted in inconclusive results. Limitations were present as evidenced in the small research samples, broad age ranges of the research samples, and numerous intervention studies that yielded unclear results and lacked specificity in their outcomes.
Translating the evidence into practice can be enhanced by collaborating with community-based groups who are the intended recipients of such services. Thus, an intervention involving personalized self-management education; a meaningful partnership between the patient, the health care provider and the community; and, the use of peak flow meters has the potential for creating positive results and improving asthma health outcomes.

**Innovation/Objectives of DNP Project**

This DNP project addressed patients’ adherence to asthma medications rather than the administration of asthma medications, given the liability in administering medications. The project implemented in Ka’u consisted of conducting an educational class for team members and participants of the project. The project was designed in accordance with two dimensions of evidence-based practice (EBP) strategies: 1) those guiding to community-based asthma education; and 2) those guiding to asthma self-management. Timeline of the project implementation was August 2015 to December of 2015.

**EBP of community-based asthma education.** Support for community-based asthma education was found in literature written by the following authors: Andrews, Jones and Mullan (2014); Tapp, et al. (2014); Federman et al. (2013); Pruit (2013); Press, et al. (2012); Wisnivesky, et al. (2012); Chen, Sheu, Chang, Wang and Huang (2010); Martin et al. (2009); To, McLimont, Wang, & Cicutto (2009); Jones (2008); and, To, Cicutto, Naushaba, McLimont, and Beyene (2008). EBP for self-management of asthma were found in research articles by: Andrews, Jones and Mullan (2014); Wechsler (2014); Federman, et al. (2013); Chen, Sheu, Chang, Wang and Huang (2010); Tousman, Zeitz, Taylor and Bristol (2010); and, Jones (2008). The literature provides evidence that community-based education can lead to risk reductions in
exacerbations and symptoms, decreased use of urgent health services, reduced productivity loss as a result of asthma, improvements with asthma self-efficacy, self-perceived coping skills and the patients’ quality of life, and, to fostering a culture of support for health care providers in adopting evidence-based practices and improving the quality of health care.


The literature showed that self-management of asthma in combination with self-efficacy, a written action plan, journal/diary writing, and use of peak flow meters can improve outcomes (Global Initiative for Asthma, 2014). Using a combination of these practices can promote fewer acute exacerbations, reduce emergency room visits, increase productivity, help increase compliance to medications, improve cognition, quality of life, and behavioral outcomes; and, decrease severity of asthma attacks by using peak flow measurements. These interventions were chosen because literature evidence showed positive results in the management of asthma.
Literature also showed that community-based asthma education and asthma self-management supports the medical aspects of asthma control (Krieger, Philby & Brooks, 2011; Krieger, Takaro, Song, Beaudet & Edwards, 2009; National Asthma Education and Prevention Program, 2012). Stoloff (2008) reported that self-management plans that include self-monitoring of symptoms and/or use of peak flows significantly reduced hospitalizations and emergency department visits (p.18). Clinical experts in asthma also suggested that these interventions were effective in asthma management (Michigan Quality Improvement Consortium, 2012; Sveum, et al., 2007; Work Loss Data Institute, 2013).

**Primary objectives.** The primary objective of the DNP project is to determine whether community-based asthma education and self-management including: self-efficacy, an asthma action plan, journal writing, and use of peak flow meters, reduces asthma exacerbations in the community of Ka’u. The CPG developed by the Work Loss Data Institute (2013) has been selected for its originality and its consistency with this literature synthesis. The Work Loss Data Institute (2013) will serve as the basis for guiding the DNP project. The DNP project’s objectives are outlined and detailed below:

**Community-based asthma education objectives.** The objectives of community-based asthma education are: 1) integrate education into all points of care where health professionals provide asthma education to community volunteers and with asthma clients, 2) provide educational materials about asthma and treatments printed in different languages such as in Ilocano, Tagalog, Spanish and English, and, 3) use a variety of educational strategies and methods such as lectures, video, audio, role play and demonstration to educate the community about asthma management.
**Asthma self-management objectives.** The objectives of asthma self-management are to: 1) provide self-management education by teaching and reinforcing symptoms of asthma self-monitoring using journal or diary writing, 2) assist the client to write an action plan that is tailored to their daily routine, work schedules, cultural beliefs and lifestyle, 3) encourage medication compliance by helping the client understand his or her asthma medication and treatments; and 4) instruct clients on how to use peak flow meters to assess lung functions for earlier medication intervention and to demonstrate the use of inhaler and spacer techniques.

**Summary**

Chapter 2 introduced the ACE Star conceptual model as a guideline for the DNP project. The local, national, and global background of asthma burden was described. The DNP project was triggered by the discovery of evidence that showed the increasing number of people being diagnosed with asthma, the high number of people with asthma in the Ka’u district, and, the effects of vog and the location of the Ka’u community in proximity to the main hospital on the Island of Hawai’i.

This literature synthesis revealed community-based asthma education and asthma self-management that includes self-efficacy, an asthma action plan, journal writing, and the use of peak flow meters as the most effective interventions for asthma control. Community-based asthma education and asthma self-management were selected as interventions to be used for the DNP project. The objectives of each intervention were established using the CPG by Work Loss Data Institute (2013) as its standard.

The purpose of this DNP project is to implement and evaluate an evidence-based asthma management program in the Ka’u district. The project incorporates asthma management
interventions into the community and decrease asthma exacerbations, therefore, improving the quality of life among asthma sufferers in the community. The aim of this project is to create a Ka’u community program to assist its members with asthma in understanding their disease, therapies, and, medications so they can create individual asthma action plans; and, to take a proactive stance in asthma self-management and partnering with clients’ health providers in managing asthma.
CHAPTER 3. METHODS

Introduction

Chapter 3 of the project is guided by point 3, translation into guidelines and point 4, practice integration of the ACE Star Model. Point 3, translation into guidelines, is the practice of transforming knowledge into action which is often referred to as development of evidence-based clinical practice guidelines, combining the evidential base with expertise to extend recommendations. At this stage the best evidence-based asthma practices were combined and presented to clients as practice guidelines. Point 4 of the ACE Star Model is practice integration in which collaboration between stakeholders, community members and participants in changing health practices occur.

Point 3, Translation into Guidelines

Objectives. The primary objective of the patient-focused EBP asthma management program is to improve asthma practices and decrease asthma exacerbations for asthmatics adults in the Ka’u District.

Objectives for community-based asthma education. The objectives of community-based asthma education are to: 1) integrate education into all points of care where health professionals provide asthma education to community volunteers and with asthma clients; 2) provide educational materials about asthma and treatments printed in different languages such as in Tagalog and English; and, 3) use a variety of educational strategies and methods such as lectures, video, audio, role play, and demonstration to educate the community in asthma management.

Objectives for asthma self-management. The objectives of asthma self-management are to: 1) provide self-management education by teaching and reinforcing symptoms of asthma self-
monitoring and oral reports; 2) assisting the client to write or verbalize an action plan that is tailored to their daily routine, work schedules, cultural beliefs and lifestyle; 3) encourage medication compliance by helping the client understand his or her asthma medication and treatments; 4) instruct clients on how to use peak flow meters to assess lung functions for earlier medication intervention and to demonstrate the use of inhaler and spacer techniques; and 5) promote smoking cessation strategies.

**Design (QI/EBP).** The Ka’u Community Asthma Management Program (KCAMP) is a quality improvement (QI) and evidence-based practice (EBP) project. It is a community-based intervention designed to improve the practice of asthma management.

Population (P), Intervention (I), Comparison (C), Outcomes (O).

**P:** Adults ages 18 and older with asthma in the Ka’u District

**I:** Provide community-based asthma education and asthma self-management training using self-monitoring, asthma action plans, oral reports, spacers, and peak flow meters.

**C:** Current asthma practices without community-based asthma education and asthma self-management.

**O:** Decrease asthma exacerbations, number of office visits, and number of emergency room visits and quality of life.

**Purpose statement.** The purpose of the KCAMP EBP project is to provide a community-based asthma education and asthma self-management training for adults ages 18 and above with asthma in the Ka’u District to improve asthma self-management and to reduce asthma exacerbations, number of office visits, and number of emergency room visits.
Innovation and practice change description. The KCAMP is an innovative project that involved community members in providing asthma education and asthma self-management skills training to asthmatic adults ages 18 and above who live in the Ka’u district. Family cooperation and community efforts in educating clients about asthma can provide a cultural and holistic approach to asthma adult management (Huber, 2005; Zuniga et al., 2011). It can also improve the amount of information remembered at home.

One-on-one asthma educational teaching sessions were given to five participants and their family members. These individuals were solicited from the Ka’u district. Family members who attended classes helped reinforced the knowledge acquired and provided support for the participant. Visits were arranged with the participants, either at their homes or at their choice of location. This approach allowed them to participate in KCAMP sessions at their convenience.

Asthma educational and self-management training was also conducted for a small group of nine people. This group consisted of participants from Hui Mālama Ola Nā ‘Ōiwi. The five participants and their family members engaged in the one-on-one sessions did not participate in this small group training. It was noted that teaching a smaller group of people proved to be more effective in asthma management by The National Asthma Education and Prevention Program Expert Panel (NAEPPEP) (2007). Participants from Hui Mālama Ola Nā ‘Ōiwi were provided asthma education and self-management training in a small group.

Hui Mālama Ola Nā ‘Ōiwi provided free transportation for the participants (Hui Mālama Ola Nā ‘Ōiwi, 2015). The organization’s driver transported the participants to and from their homes to the Hawai’i County Economic Opportunity Council Center (HCEOCC) at Na‘ālehu
Park for their first two sessions, and to Hui Mālama Ola Nā ʻŌiwi’s Naʻālehu office for their three remaining sessions.

**Who, what, when, where, and how.** The project was for adults diagnosed with asthma that were living in the Kaʻu district. It was implemented in Naʻālehu, which is in the Kaʻu district from August 2015 through December 2015. The project provided an interactive, culturally tailored asthma community education and self-management training.

**Relative advantage.** Relative Advantage is “the degree to which an innovation is perceived as being better than it supersedes” (Rogers, 2003, p.229). The CDC reported that the medical cost of treating asthma patients in the U.S. was $56 billion per year (CDC, 2014). In 2009, Hawaiʻi’s cost of asthma care related emergency department visits was $10.4 million and hospitalizations were $24.4 million (Hawaiʻi State Department of Health, 2010). The KCAMP can be integrated into participant’s community health visits, thus costing much less than emergency services of acute hospitalizations. The significance of the approach used by the KCAMP is it will help to decrease asthma attacks among asthmatics, thus helping to keep individuals away from emergency room and in-patient admissions, which will be advantageous to the community’s health and socio-economic well-being.

Kaʻu has a small rural health hospital that has a limited capacity in providing advanced respiratory care. Asthma patients who require more than immediate therapy need to be transported to Hilo Medical Center (HMC), the only fully operational hospital in Hilo, which is more than 60 miles away from Kaʻu (HMC, 2015). The increased travel time has the potential for negative outcomes for patients in an emergency situation. The advantages of the KCAMP are that it will help to decrease hospitalization and transportation costs, it will save time, and
minimize discomfort and disruption of daily living for the community’s asthmatics and their family members. Using a community participatory approach to delivering asthma education and skills training will increase the participants’ chances of embracing the asthma program.

**Compatibility.** Compatibility is the “degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters” (Rogers, 2003, p.240). The KCAMP is compatible with Hui Mālama Ola Nā ‘Ōiwi’s (2015) existing programs. The organization provides a wide variety of health enhancement services for Native Hawaiians through advocacy, accessibility and education. Services include, but are not limited to, facilitating access to health care through outreach, referrals, transportation and health screening and networking with other health care providers, State and County Agencies, Schools and Community Organizations. Other services include: Health risk appraisals, medication management, blood pressure and glucose checks, and health assessments. The organization has health promotion and disease prevention programs which focus on Native Hawaiian health, diabetes, cardiovascular diseases, breast cancer awareness, smoking cessation, nutrition, weight management, prenatal care, and substance abuse. The KCAMP falls under the Hui Mālama Ola Nā ‘Ōiwi’s health promotion and disease prevention services.

**Complexity.** Complexity is the “degree to which an innovation is perceived as relatively difficult to understand and use” (Rogers, 2003, p.257). The asthma education lessons were developed using simple wordings, and short and clear sentences. Asthma educational materials were printed in English, with some materials printed in different languages. The asthma skills training of journal writing did not require grammar and spell checking. The use of peak flow meters and spacers were demonstrated in a simple two-step procedure of blowing and
documenting. Several teaching strategies were incorporated to meet the different learning styles, these included: Distribution of pamphlets, power point presentations, pictures, video watching, and skill development through participant role playing. Hui Mālama Ola Nā ʻŌiwi’s staff and community volunteers were included in the planning of project activities. Having Hui Mālama Ola Nā ʻŌiwi staff and trained community volunteers ensured that the project would continue without the project leader in the event of an emergency and/or when she became incapacitated.

**Trialability.** Trialability is the “degree to which an innovation may be experimented with on a limited basis” (Rogers, 2003, p.258). The educational classes, skills training and developed questionnaires were pilot-tested with the community volunteers in the summer of 2015. Pilot-testing was a method useful for gaining insight into the areas needing improvement. The feedback of the community volunteers was helpful in finalizing the project’s activities and revising the questionnaires for this project.

**Observability.** Observability is the “degree to which the results of an innovation are visible to others” (Rogers, 2003, p.258). The asthma management program included family members, staff and community volunteers’ observations of the participants’ responses. This involved surveillance of participants’ interactions with each other, their families, staff members, and community volunteers. The decreased number of asthma exacerbations may be observed by the decreased incidences of audible wheezing.

**Plan for sustainment.** The DNP project is sustainable by Hui Mālama Ola Nā ʻŌiwi staff, community volunteers, and private donors. Educational materials were provided by the American Lung Association in Hawaiʻi (ALAH). Instruments to measure pre and post intervention FEV1 and peak flow meters were provided by a private donor. Hui Mālama Ola Nā
‘Ōiwi staff and community volunteers assisted in program implementation and collection of data. Other strategies for sustaining the DNP project included marketing the program to local and community stakeholders, and partnering with Hui Mālama Ola Nā ʻŌiwi.

Future plans are in process to continue the program with Hui Mālama Ola Nā ʻŌiwi. This DNP student will remain as head of the program, as a volunteer for the organization, and will actively seek grants and/or donations for KCAMP. In addition, there are plans to present this program to political organizations in attempts to gain collaboration and funding for sustaining KCAMP. Other future plans for sustaining the project are to develop relationships with the Bay Clinics, American Lung Association Hawaiʻi (ALAH), Hawaiʻi Medical Services Association (HMSA) and other local organizations. Training community members in teaching the asthma education and self-management program will also help to sustain the program in the future.

**Definitions.** The definitions of asthma status are provided to facilitate the mapping of the process and outcome measurements of the program to the project aims.

*Conceptual definitions of asthma status.* Asthma is defined by GINA as a heterogeneous disease usually characterized by airway obstruction, airway hyper-responsiveness (AHR) and chronic airway inflammation (GINA, 2015). Data from the Severe Asthma Research Program (SARP) cluster analysis suggests that pre-bronchodilator forced-expiratory volume one (FEV1) (% predicted) is a better indicator of future asthma risks (GINA, 2015).

*Operational definitions of asthma status.* Self-reports of the participants’ perceptions and knowledge of self-management of asthma attacks, symptoms and control as measured by preliminary and post survey of asthma control tests, peak flow and spirometry levels, and the number of asthma attacks or exacerbations.
**Definitions of variables.** Asthma is a common chronic inflammatory disease of the airways characterized by variable and recurring symptoms, reversible airflow obstructions and bronchospasms. Common symptoms include wheezing, coughing, chest tightness, and shortness of breath (National Heart, Lung and Blood Institute (NHLBI), 2014; Rendell, et al., 2009).

Asthma exacerbations are mild, moderate and severe events that require urgent action on the part of the physician to prevent hospitalizations or death from asthma (Nathan, et al., 2004). Asthma control refers to the best consideration where patient feels their level of disease maintenance is acceptable and they are able to function well within their activities (Rendell, et al., 2009).

Asthma Control Test (ACT) (Appendix A) is defined as a patient self-administered reliable tool for identifying those with poorly controlled asthma. ACT has five items with a 5 point rating scale for symptoms and activities: 1 (all the time) to 5 (not at all); and, an asthma control rating: 1 (not controlled at all) to 5 (completely controlled). The scores range from 5 (poor control of asthma) to 25 (complete control of asthma), with higher scores reflecting greater asthma control. An ACT score >19 indicates well-controlled asthma (Nathan et al., 2004).

A peak flow meter is a portable, inexpensive, hand-held device used to measure how air flows or peak expiratory flow (PEF) from a person’s lungs in one “quick blast” of breath (ALA, 2015). It has a sliding marker or arrow at the bottom of the numbered scale (zero is the lowest number on the scale) that is divided into traffic light signal color zones. A reading in the green color zone indicates a level of 100 percent which means that asthma is under reasonably good control. A yellow color zone reading indicates that air flow is 50-80 percent of the person’s usual or normal lung air flow and the asthmatic needs to take cautionary measures. Symptoms
can get better or worse depending on what the person does, or how and when the asthmatic uses prescribed medications. Asthmatics are advised to seek help from healthcare professionals or follow an asthma action plan. A reading in the red color zone indicates that air flow is falling below the 50-80% usual capacity. Severe airway narrowing may be occurring. Asthmatics are instructed to take their rescue medications immediately and contact their healthcare provider. They must also follow their asthma action plan and/or call medical assistance (ALA, 2015).

Spirometry measurements of airflow and air volume are extremely useful in the assessment of asthma and other respiratory disorders. It is the most common of the lung function tests used for asthma (Bass, 2014). It's a simple, quick, and painless way to check lungs and airways. Asthmatics are instructed to take a deep breath and exhale into a hose attached to the device. It records how much air the asthmatic blows out in one second (FVC1, or forced vital capacity) and how quickly it’s performed (FEV1, or forced expiratory volume). The score is lower if the airways are swollen or constricted because of asthma (ALA, 2015). The FEV1 is the maximal amount of air that is forcefully exhaled in one second. It is then converted to a percentage of normal. For example, a person’s FEV1 may be 80% of predicted based on their height, weight, and race. FEV1 is a marker for the degree of obstruction such as: FEV1 greater 80% of predicted= normal, FEV1 60% to 79% of predicted = Mild obstruction, and FEV1 40% to 59% of predicted = Moderate obstruction (Bass, 2014).

**Sampling plan.** The sampling plan describes factors and strategies that were used to obtain a sample for the KCAMP.

**Setting.** The asthma program’s activities and program data collection took place at HCEOC and Hui Mālama Ola Nā ‘Ōiwi (2015). HCEOC and Hui Mālama Ola Nā ‘Ōiwi, Ka’u
Hui Mālama Ola Nā ʻŌiwi is a private, non-profit organization founded in 1985 as the Puna Community Caring Health System in collaboration with Alu Like, Inc. Hawaiian community leaders (mostly farmers), health professionals, technicians, and educators responded to the Puna Hui ʻOhana’s concern about the Native Hawaiians reluctance in seeking medical care until it was too late.

Their vision and mission is:

“We are the group that takes care of the health of Hawaiian people. Our mission is:

To uplift the health of the Hawaiian nation

We will:

Take care of Hawai‘i Island
Take care of country and rural areas
Take care of your physical, spiritual, and mental body
Take care of Hawaiian culture and practices

We envision a strong and healthy Hawaiian nation (Hui Mālama Ola Nā ʻŌiwi, 2015).”

Characteristics of the organization. Authority innovation-decisions and structural characteristics. Authority innovation-decisions are decisions made by individuals in a system that has authority to accept or reject an innovation (Rogers, 2003). Hui Mālama Ola Nā ʻŌiwi is governed by board directors, operational director, and outreach clinical supervisor. Their staff include: Educators, outreach workers and administrative staff. The operational director makes the majority of decisions in the organization.
Organizational innovativeness. The characteristics of the organization provide an opportunity for innovativeness. Hui Mālama Ola Nā ʻŌiwi’s outreach clinical supervisor has asthma and is a former asthma open airways educator. She supports this project, and also expressed desire to see its results, perhaps incorporating this program into their organization in the future.

The organizations’ complex and diverse staff also provides varied expertise for innovation. There is an emphasis to follow the rules and regulations set by non-profit organizations. These rules and regulations guide the processes in innovation implementation. As the organization continues to seek affiliations with various organizations statewide it also continues to network and develop interpersonal links. This characteristic proves that the organization remains current and is open to new projects.

Social and economic environment. Hui Mālama Ola Nā ʻŌiwi is partnered with other local organizations and state organizations, and is involved with community activities. The economic sustainability of the Hui Mālama Ola Nā ʻŌiwi programs and activities are funded by government, private grants and donations.

Physical and political environment. The location of Hui Mālama Ola Nā ʻŌiwi is accessible to the community through paved roadways. The center is connected to the internet and is adjacent to a fire station with emergency medical services and ambulance (EMS). The Hui Mālama Ola Nā ʻŌiwi is affiliated with various local, academic, and state organizations.

Hui Mālama Ola Nā ʻŌiwi is in collaboration with Alu Like, Edith Kanaka’ole Foundation, The Office of Hawaiian Affairs, The Queen Lili’uokalani Children’s Center Native Hawaiian Health Scholarship Program, Hawai’i Community Foundation.
Unnatural Causes, Hope Services Hawaii, Hilo Bay Clinic, Ka`u Family Health Center, Keaau Family Health Center, Pahoa Family Health Center, North Hawaii Community Center, Department of Human Services Social Services Division, Health, and the Polynesian Cultural Immersion Summer Camp for kids and The Children of The Land.

**Sample.** A purposeful sampling of adults with asthma that live in Ka`u was recruited to participate in the asthma management program. The program was restricted to adults, ages 18 years old and above.

*Target population.* The target population for the KCAMP was adult community members diagnosed with asthma who live in the Ka`u district.

*Accessible sample.* The accessible samples are patients receiving health and asthma care or clients of Hui Mālama Ola Nā ‘Ōiwi.

*Sample size.* Convenience sampling is a non-probability sampling technique that uses subjects that are accessible to the researcher (Burns & Groves, 2009). Using this sampling method allows individuals to participate as volunteers for the KCAMP project. The KCAMP was offered in one-on-one meetings and in group sessions to help increase recruitment and provide ease of access to the program. There were 14 participants in the KCAMP project. Nine participated in group sessions and five received individualized one-on-one sessions.

Martin et al. (2009) reported that community-based asthma intervention with small number of participants improved asthma self-efficacy, self-perceived coping skills, and asthma quality of life for low-income African American adults. The results in Martin (2009) provide evidence that using a small sample in community health programs can be effective. In addition,
initiating this program as a pilot project of the KCAMP was an appropriate first step to determine whether the program can save time, is cost-effective, and can represent adult asthmatics.

**Inclusion criteria.** Adults that were 18 years and older from Ka’u who had a diagnosis of asthma participated in the program. There were no restrictions regarding socioeconomic status, gender, occupation, or any length of time with asthma. The inclusion criteria provided a sample population with a wide range of perspectives and experiences with the disease. Personnel that are included as program staff are those trained in administering asthma questionnaires and surveys, using and interpreting peak flow meters’ values, and obtaining and interpreting spirometry lung function readings. Attendance in asthma education and participation at data collection sessions was required of the program’s educators, data collectors and evaluators.

**Exclusion criteria.** Individuals diagnosed with cardio-pulmonary obstructive disease (COPD), mental illness, and those that were unable to read, write or communicate in English were excluded from participation. The project’s educators, data collectors and evaluators were excluded if they did not receive asthma interventions training.

**Recruiting/Marketing plan.** Interpersonal communications channels and mass media were used to promote the project and to recruit participants. The project was advertised in the mass media through emails via: Ka’u Rural Health Community Association Incorporated (KRHCAI) web links, KRHCAI pages, Ka’u Community Newsletter, and through website blogs. The project’s press release was printed in the Ka’u Calendar and KRHCAI website on August 2015 (Appendix B). Flyers (Appendix C) and a banner (Appendix D) which included the project’s information and contact numbers were developed, and distributed among the various businesses and clinics in Ka’u, and the public health nurses in Hilo.
Social support can mobilize activities and advocate for behavior change (Briscoe & Aboud, 2012). Using social support through interpersonal channels occurred in the form of face-to-face exchanges between the project’s staff, community members, and stakeholders. One-to-one meetings, conversations and educational sessions were used to promote the program, gain support for it, and for recruitment. Active performance-based techniques that are effective include modeling or demonstration (Briscoe & Aboud, 2012). Staff training and participant education were conducted through hands-on experience, modeling and demonstrating the use of peak flow meters and Spirometry Instruments, and documenting asthma status. The combination of different communication strategies provided greater opportunity for reaching a broader audience.

A change agent is important for successful implementation (Van Patter Gale & Schaffer, 2009). Change agents possess the characteristics of: positive enthusiasm, good communication, empathetic disposition, and the ability to evaluate (Rogers, 2003). To engage users, change agent was utilized during the recruitment, marketing plan and implementation of the project.

Late majority adopters may be born out of economic necessity and can be influenced by increasing social pressure. Because of this, an incentive in the form of gifts will help in having this population join the program (Rogers, 2003). The KCAMP provided a variety of recognitions for participants, e.g., peak flow meters, spacers, various small gifts, and provided refreshments at each session for participating to engage the late majority and laggard adopters. Using the innovators, early adopters and late majorities helped in influencing and in convincing the laggards. Family, and close friends were also used to convince the laggards. Since these members are living in the past, using past practices and incorporating new skills might be the
best for them. Personally calling, meeting with them, and allowing them to express their thoughts, ideas and knowledge about traditional asthma medicine or management practices were conducted to engage with them.

The persuasion stage is a process when the individual is psychologically involved with the innovation and forms an unfavorable or favorable attitude towards the innovation (Rogers, 2003). In this stage, the adopters will naturally feel the uncertainty of the innovation. According to Rogers (2003), the individual adopters will be fearful of the unknown, and will usually seek social reinforcement from others. In attempts to persuade and reduce the uncertainty about an innovation’s expected consequences, the strategies used included: Providing the participants contact numbers and email addresses, and using key informants to make and maintain connections with clients.

According to Talbot and Verrider (2010) mass media campaigns that have a memorable logo or catchy slogan have promoted wide awareness. The slogan used to promote awareness of the KCAMP is, “Breathe Easy, Ka’u”. The slogan was included in the program’s printed materials.

According to Tse, et al. (2015), “Community gatherings were identified as mechanisms to garner and locate resources for addressing the community issues” (p.5). The activities planned for enlisting participants and promoting the project’s awareness included community events such as conferences, community picnics, and community fairs. Obtaining support from the local businesses, asking them to set up information tables in front of their business was another activity used for marketing the program, promoting awareness and recruitment. Requesting client referrals from Hui Mālama Ola Nā ʻŌiwi was also conducted for filling the Other
strategies for sustaining the DNP project included marketing the program to local and community stakeholders, and partnering with Hui Mālama Ola Nā ‘Ōiwi.

Future plans are in process to continue the program with Hui Mālama Ola Nā ‘Ōiwi. This DNP student will remain as head of the program, as a volunteer for the organization, and will actively seek grants and/or donations for KCAMP. In addition, there are plans to present this program to political organizations in attempts to gain collaboration and funding for sustaining KCAMP. Other future plans for sustaining the project are to develop relationships with the Bay Clinics, American Lung Association Hawai’i (ALAH), Hawaii Medical Services Association (HMSA) and other local organizations. Training community members in teaching the asthma education and self-management program will also help to sustain the program in the future.

Banners, posters and flyers describing the project at Ka’u Rural Health Community Association Incorporated (KRHCAI) and at the fore mentioned events provided visual awareness.

**Point 4, Integration Stage**

**Data collection procedures.** Data were collected from group sessions and individualized one-on-one sessions attended by the participants.

*Chronological order of data collection procedures: Group sessions*

*Session 1: Orientation.* The KCAMP community volunteers and Hui Mālama Ola Nā ‘Ōiwi staff arrived at the HCEOC center by 0700 a.m. for set-up. The participants were transported by Hui Mālama Ola Nā ‘Ōiwi’s driver and arrived at the HCEOCC center at 0830 a.m. A continental breakfast was served while the KCAMP staff and volunteers registered them. The staff collected demographic surveys (Appendix F), blood pressures, heart rates, oxygen
saturations, heights, weights and forced expiratory lung measurements (FEV1) using the spirometry machine. A folder containing information about the KCAMP (Appendix E) was provided. The ACT (Appendix A) and MiniAQLQ Questionnaire (Appendix H) were completed. Every participant was given a small gift pack as an incentive for their participation in the session.

Hui Mālama Ola Nā ʻŌiwi staff continued the session by introducing the project leader and the project community volunteers. The KCAMP were presented and participants were informed of the activities that they will be participating in. The session was two-hour long with one, a fifteen-minute break. One hour was devoted to going over the program with the participants and for answering questions.

The staff collected demographics surveys (Appendix F), blood pressures, heart rates, oxygen saturations, heights, weights and forced expiratory lung measurements (FEV1) using the spirometry machine. The Pretest ACT (Appendix A), and MiniAQLQ Questionnaire (Appendix H) were also administered and collected. Participants also answered the Asthma Interview Questionnaire (Appendix I). At the end of the session the participants formed in a circle and shared their asthma experiences. They were asked to voice any concerns and encouraged to ask questions, they were then driven home by Hui Mālama Ola Nā ʻŌiwi’s driver and staff.

Session 2: Educational session. The KCAMP community volunteers and Hui Mālama Ola Nā ʻŌiwi staff arrived at the HCEOCC center at 0700 a.m. The participants arrived at the HCEOCC at 0830 am in the Hui Mālama Ola Nā ʻŌiwi van at 0830 a.m. at HCEOCC. A continental breakfast was served while the KCAMP staff and volunteers registered them and obtained their blood pressures, pulses and oxygen saturation levels. A folder containing
information about the KCAMP Educational Session, Asthma 101 pamphlets, and asthma disease brochures were provided. Other brochures included in the folder were on smoking cessation, weight control, flu vaccinations, recognizing asthma triggers and the Asthma Education Session: Knowledge Pre and Post Questionnaire (Appendix J). The participants also received gift bags of various items to take home.

Prior to partaking in the session the participants were given the Asthma Educational Session: Knowledge Pretest (Appendix J). After the pretest, the class continued with “talk story” session. The session lasted two hours with two, fifteen-minute breaks.

In the second session, the participants learned about the pathophysiology and implications of asthma, how to recognize asthma triggers, how to eliminate and avoid their asthma triggers, and learned about the complications of unmanageable asthma through discussion and readings of the asthma materials and the asthma 101 booklet (Appendix K) provided by ALAH. They also watched videos about asthma pathophysiology, how to manage asthma attacks with a rescue inhaler, and calling for help and dialing 911 for ambulance assistance.

The participants were encouraged to understand their medications, and the importance of keeping their doctor’s appointments, having regular check-ups, handwashing, cleanliness, taking flu vaccine and smoking cessation. To evaluate that the information was well understood and received by the participants, Asthma Educational Session: Knowledge Posttest Questionnaires (Appendix J) were distributed to and collected from the at the end of the session. The date of the next class meeting was announced prior to dismissal.
Session 3: Asthma self-management skills training. The third session comprised of skills self-management training. The KCAMP community volunteers and Hui Mālama Ola Nā ʻŌiwi staff arrived at the Mālama Ola Nā ʻŌiwi at 0700 a.m. for set-up. This location included an air-conditioned conference room with internet connection which made the session convenient and comfortable. The participants were transported by Hui Mālama Ola Nā ʻŌiwi’s driver and arrived at the center at 0830 a.m. A continental breakfast was served while the KCAMP staff and volunteers registered participants.

The participants received a folder containing information about how to use a peak flow meter, how to calculate green, yellow and red zones, directions on using a spacer, and instructions on keeping an asthma diary. Every participant again, received an incentive gift bag for attending the session. The session began with a review of the last session, and an Asthma Skills Knowledge Pretest was administered (Appendix L). This session was a two and a half hours long with two, fifteen-minute breaks. The session was comprised of teaching and demonstrating the use a peak flow meter; obtaining their peak flow, personal best value; and assisting the participants in calculating their green zone (80 to 100 percent of personal best) which indicates good control, yellow zone (50 to 79 percent of personal best) which indicates caution: asthma is getting worse, and red zone (below 50 percent of personal best) which indicate that immediate, urgent medical help is needed and call 911. The use of spacers with their asthma inhalers and instructions on creating their own asthma action plan (Appendix M) incorporating their work or personal schedules were given. The teaching and demonstration were conducted by this DNP student, a KCAMP community volunteer, and two guest speakers. One of the guest speakers, a Doctor in Pharmacy, also assisted the participants in calculating their best peak flow
meter values, a demonstrated how to use the peak flow meter, a spacer, and answered participants’ questions on medications. The other guest speaker, was an asthma sufferer who shared his experiences with asthma and its management. He also helped teach the participants on how to use the peak flow meter and spacers.

The participants were required to return demonstration, by using their peak flow meters and spacers in order to evaluate whether they understood the information and instructions provided. They were also encouraged to share their experiences, and ask questions. An Asthma Skills Knowledge Posttest was administered and collected at the end of the session (Appendix L). At the end of the session, the next session date was announced, and the participants were encouraged to contact this DNP student for any questions and concerns.

Session 4: One-month post-implementation. The KCAMP community volunteers and Hui Mālama Ola Nā ‘Ōiwi staff arrived at the Mālama Ola Nā ‘Ōiwi at 0700 a.m. The participants were transported by Hui Mālama Ola Nā ‘Ōiwi’s driver, and arrived at the location at 0830 a.m. A continental breakfast was served, while the KCAMP staff and volunteers registered the participants and collected their vital statistics of weight, height, and blood pressure. The one-month peak flow measurements and oxygen saturation levels, the ACT (Appendix A), MiniAQLQ Questionnaire (Appendix H), Asthma Interview Questionnaire (Appendix I), Asthma Educational Session: Knowledge Posttest Questionnaires (Appendix J), Asthma Skills Knowledge Test (Appendix L), and an Asthma Journal Questionnaires (Appendix N) were collected. The participants’ journals were also gathered. Each participant received a gift incentive. One of the participants brought along their 10-year-old granddaughter who also
suffers from asthma. The child received a one-on-one brief asthma education, a peak flow meter, and a children’s book about asthma courtesy of the ALA Open Airways program.

Session 5: Three months’ post-implementation. In the three-months post-implementation, only six participants attended the session. The other participants were working or had other unanticipated personal commitments. A second session was arranged to see the other three. Both sessions kept the same schedules as the previous four sessions. The mode of transportation remained the same, participants were transported by Hui Mālama Ola Nā ‘Ōiwi and arrived at this location at 0830 a.m. A continental breakfast was served while the KCAMP staff and volunteers registered attendees, and collected their weight, height, and blood pressure data, their one month FEV1 measurements and oxygen saturation. The session began with a fun activity in the form of sharing participants’ experiences of the last three months. In this session, the ACT (Appendix A), MiniAQLQ Questionnaire (Appendix H), Asthma Interview Questionnaire (Appendix I), Asthma Educational Session: Knowledge Posttest Questionnaires (Appendix J), Asthma Skills Knowledge Test (Appendix L), and an Asthma Journal Questionnaire (Appendix N) were administered and collected. The participants’ journals were also gathered. Measurements of FEV1 and peak flow levels were taken. Lunch was served, every participant received a gift bag, and presented with a certificate of appreciation (Appendix N) for their participation in the program. Table 1 presents a list of group implementation collection points.
Table 1

*Group Implementation Collection Points*

<table>
<thead>
<tr>
<th>Implementation Sessions</th>
<th>Measurement Tools</th>
<th>Sessions</th>
<th>Week Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation</td>
<td>Personal Information Demographics ACT pretest MiniAQLQ pretest Spirometry (FEV1 Level): Baseline Interview Questions</td>
<td>Session 1</td>
<td>1</td>
</tr>
<tr>
<td>Education Session</td>
<td>Knowledge Pretest and Post-tests</td>
<td>Session 2</td>
<td>2</td>
</tr>
<tr>
<td>Asthma Skills Self-Management Training Session</td>
<td>Asthma Skills Tool Pretest and Post-test</td>
<td>Session 3</td>
<td>3</td>
</tr>
<tr>
<td>One-month group post-implementation</td>
<td>ACT posttest MiniAQLQ Questionnaire Asthma Educational Knowledge Posttest Asthma Skills Posttest Peak Flow Measurements Oral Reports Asthma Journal &amp; Questionnaire Interview Questions</td>
<td>Session 4</td>
<td>8</td>
</tr>
<tr>
<td>Three-months group post-implementation</td>
<td>ACT posttest MiniAQLQ Questionnaire Asthma Educational Knowledge Posttest Asthma Skills Posttest Peak Flow Measurements Oral Reports Asthma Journal &amp; Questionnaire Interview Questions Spirometry (FEV1) Measurements</td>
<td>Session 5</td>
<td>20 and 21</td>
</tr>
</tbody>
</table>

(2 sessions created: one for 6 participants and one for 3 participants)
Chronological Order of Data Collection Procedures: One-on-One Sessions

Session 1: Orientation and asthma education. One-on-one individual sessions were provided for five participants at separate times permitting their preferences and personal schedules. Contact numbers were solicited and appointments were scheduled for each of the five participants through phone calls. This DNP student and the participants met at the participants’ home (two participants), at a coffee shop (two participants) and at a park recreational center (one participant).

In the first session, each of the five participants were oriented to the program. Every participant had at least one family member or a friend with them at the one-one sessions. The session began with casual conversation in getting to know the participants at which they were provided an overview of the KCAMP project. They were provided the KCAMP information listed in Appendix E. The demographic survey (Appendix F), ACT pretest (Appendix A), MiniAQLQ pretest (Appendix H) and Asthma Educational Session: Knowledge Pre and Posttest (Appendix J) were administered and collected. Height, weight, and blood pressure information, and oxygen saturation and a FEV1 baseline measurements were gathered. A separate folder containing information about the KCAMP Educational Session, Asthma 101 pamphlets (Appendix K), and asthma disease brochures were provided. Other brochures included in the folder were on smoking cessation, weight control, flu vaccinations, recognizing asthma triggers and the Asthma Education Session: Knowledge Pre and Post Questionnaire (Appendix J).

At this session, the participants and their family members or friends learned about the pathophysiology and implications of asthma. They also learned how to recognize asthma triggers, to eliminate and avoid their asthma triggers and the complications of unmanageable
asthma thorough discussions, readings and watching videos. The videos were viewed on a television connected to a laptop computer, and were about asthma pathophysiology, how to manage asthma attacks with a rescue inhaler, and calling for help and dialing 911 for ambulance assistance. The participants were encouraged to understand their medications, taught how to take their medications and the importance of keeping their doctor’s appointments, having regular check-ups, performing proper handwashing, being mindful of cleanliness, taking flu vaccines and about smoking cessation. The post session test was administered using the Asthma Educational Session: Knowledge Test (Appendix J) to evaluate whether the participants understood the information presented. They were given a gift bag as a form of appreciation and inventive for participating and continuing in the program. Arrangements were then made to meet for their second sessions.

**Session 2: Asthma self-management skills training.** The second sessions consisted of skills self-management training. These sessions were individually scheduled with the five participants, and confirmed via phone calls with each individual prior to meeting with them. They were individually seen in their homes. There were at least one family member present for four of the participants during their home visit. One participant, had three of her family members present during the visit.

The participants received individual folders containing information about using a peak flow meter; calculating green, yellow and red zones; using spacers; and, instructions on creating an asthma diary. They also received a notebook, a spacer, and a peak flow meter and had their blood pressure taken. The lessons started with a “talk story” approach, a casual, non-formal conversation with the participants. The information gathered in the previous sessions were
reviewed. Asthma Skills Knowledge pretest (Appendix L) were administered and collected. This session lasted three hours, and consisted of teaching and demonstrating the use a peak flow meters; obtaining their peak flow meter personal best value; and, helping the participants in calculating their green zone (80 to 100 percent of personal best) which indicate good control, yellow zone (50 to 79 percent of personal best) which indicate caution: asthma is getting worse and red zone (below 50 percent of personal best) which alerts the user to seek immediate medical attention and dial 911. Instructions on using spacers with asthma inhalers and creating asthma action plans (Appendix M) were given.

The participants demonstrated before the presence of this DNP student the use of their own peak flow meters and spacers to assess whether the information from the session was understood by the participants. An Asthma Skills Knowledge Posttest was also administered and collected at the end of the session (Appendix L). Information was given to arrange a one-month follow-up, and they were encouraged to make contact for any questions and concerns in the interim.

Session 3: One-month post-implementation. Scheduled appointments for each participant were arranged via phone calls. They were individually seen in their homes with the presence of one or more family members. Two participants had four family members who were present during the home visit, and three participants had one family member who also asked questions regarding asthma. Heights, weights, blood pressures, oxygen saturations and peak flow measurements were collected. The ACT (Appendix A), MiniAQLQ Questionnaire (Appendix H), Asthma Interview Questionnaire (Appendix I), Asthma Skills Knowledge Test (Appendix L), and an Asthma Journal Questionnaire (Appendix N) were completed at the end of each
participant’s respective session. Asthma journals were also collected if they had journal entries. The session lasted two hours for four of the participants, one participant had a three-hour home visit. This individual had more questions and needed added assistance in filling out all of the questionnaires.

Session 4: Three months’ post-implementation. This session was arranged and scheduled in the same manner as the previous three sessions. The participants were individually seen in their homes in the presence of one or more family members. The session began as usual, in casual conversation sharing about the participants’ experiences over the past three months. FEV1 values, peak flow meter measurements, oxygen levels, blood pressures, heights and weights were recorded. At this session, ACT (Appendix A), MiniAQLQ Questionnaire (Appendix H), Asthma Interview Questionnaire (Appendix I), Asthma Skills Knowledge Test (Appendix L), and an Asthma Journal Questionnaire (Appendix N) were administered and collected. The participants’ journals were not collected because none of them recorded entries. They were provided holiday gift bags and presented with a certificate of appreciation (Appendix O). Table 2, Individualized One-on-One Session Collection Points details the individual one-on-one session collection points.
### Table 2

**Individualized One-on-One Session Collection Points**

<table>
<thead>
<tr>
<th>Implementation Sessions</th>
<th>Measurement Tools</th>
<th>Sessions</th>
<th>Week Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation and Education Session</td>
<td>Personal Information Demographics ACT pretest MiniAQLQ pretest Spirometry (FEV1 Level): Baseline Interview Questions Knowledge Pretest and Post-tests</td>
<td>Session 1</td>
<td>1</td>
</tr>
<tr>
<td>Self-management Training Session</td>
<td>Asthma Skills Tool Pretest and Post-test Peak Flow Levels</td>
<td>Session 2</td>
<td>1</td>
</tr>
<tr>
<td>One-month individualized post-implementation</td>
<td>ACT posttest MiniAQLQ Questionnaire Asthma Knowledge Posttest Asthma Skills Posttest Peak Flow Measurements Oral Reports Asthma Journal &amp; Questionnaire Interview Questions</td>
<td>Session 3</td>
<td>8</td>
</tr>
<tr>
<td>Three-months individualized post-implementation</td>
<td>ACT posttest MiniAQLQ Questionnaire Asthma Knowledge Posttest Asthma Skills Posttest Peak Flow Measurements Oral Reports Asthma Journal &amp; Questionnaire Interview Questions Spirometry (FEV1 level) Measurements</td>
<td>Session 4</td>
<td>20</td>
</tr>
</tbody>
</table>
**Required resources.** The required resources for the project were acquired from private donors and volunteers. Teaching materials, peak flow meters, spacers, spirettes and spirometry machine were privately donated. Hui Mālama Ola Nā Ōiwi staff and volunteers, in conjunction with this DNP student provided the breakfast meals and incentives for the participants.

**Budgetary.** The itemized expenses included the program’s incentive gifts, weighing scale, measuring tapes, notebooks and food costs totaled approximately $1,000. Banner, posters, flyers, and printing materials were budgeted at $300.

**Human.** The program was implemented by this project leader, one trained nursing student community volunteer, two staff members of Hui Mālama Ola Nā Ōiwi. There were two guest speakers.

**Physical.** The educational classes and asthma management skills training were conducted at the HCEOC center and at Hui Mālama Ola Nā Ōiwi both located in Naʻālehu, Hawaiʻi. The individualized one-on-one educational and asthma management skills training sessions were conducted at various locations and in the participants’ homes in the Kaʻu District.

**Process and Outcome Variables.** The project is an asthma EBP project that measure processes and outcomes related to the interventions implemented by the asthma community management program.

**Process Measures.** Process measures evaluate whether activities of the program were implemented as planned. It is an evaluation process that helps distinguish the causes of or the barriers to poor program performance (CDC, 2011b). The types of data collected were both quantitative and qualitative. Observations of participants’ interactions with each other, reports,
checklists and attendance sheets were used to collect data to evaluate whether the activities of the program were implemented as planned.

*Outcome Measures.* Outcome measures determine whether the outcome of the program brought changes in practice (CDC, 2011b). The outcome measures determine if the outcomes of the program were related to the program’s specific activity. The type of data that was collected were both quantitative and qualitative. Multiple data collection points were performed to identify clinical significance and trends through use of pre and post-tests of ACT (Appendix A), MiniAQLQ Questionnaire (Appendix H), Asthma Interview Questions (Appendix I), Asthma Educational: Knowledge Pre and Posttest (Appendix J), Asthma Skills Knowledge Pre and Posttest (Appendix L) and Asthma Journals Questionnaire (Appendix N). A collection of baseline and post one and three-months’ peak flow meter measurements, spirometry FEV1 measurements, and oral reports from the participants were also collected. The results from these evaluation tools provided the outcome measures of the KCAMP DNP project. The process and outcome measures are represented in Table 3.
Table 3

**Process and Outcome Measures**

<table>
<thead>
<tr>
<th>Variables (What)</th>
<th>Who?</th>
<th>Data Collection Point (When)</th>
<th>Instruments (How)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Process Measures</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barriers to Implementation</td>
<td>Participants and staff</td>
<td>Participants’ schedules, attendance, transportation, and weather.</td>
<td>Observations of participants’ interactions, Attendance records, Reports from the participants and staff, Checklists</td>
</tr>
<tr>
<td><strong>Outcome Measures</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthma Status</td>
<td>Participants</td>
<td>During Orientation or session, and in one month and three months’ follow-up.</td>
<td>ACT and MiniAQLQ pretests, FEV1 levels, Interview Questions and Journal and Oral Reports</td>
</tr>
<tr>
<td>Asthma Knowledge</td>
<td>Participants</td>
<td>Prior to asthma educational session. Immediately after educational session, and in one month and three months follow up.</td>
<td>Asthma Educational Knowledge Pre and Post-test</td>
</tr>
<tr>
<td>Asthma Skills Knowledge and Competence</td>
<td>Participants</td>
<td>Prior to receiving asthma self-management skills session. Immediately after receiving asthma self-management skills session, and in one month and three months follow up.</td>
<td>Asthma self-management skills competence pre and posttest</td>
</tr>
<tr>
<td>Qualitative Data</td>
<td>Participants</td>
<td>Every session</td>
<td>Oral reports, group discussions, Interview Questions, Journal entries &amp; Journal Questionnaire</td>
</tr>
</tbody>
</table>
Measurements Tools. The instruments used to measure the program’s process and outcome variables were a combination of published instruments and those designed by this DNP student.

Published measurement tools. The Asthma Control Test (ACT) is a five-item tool that measures lung function with questions regarding shortness of breath, night symptoms, rescue medications, daily functioning and asthma perceptions (Appendix A). ACT evaluates the most recent four-week time period where each item is scored with the numbers 1 through 5, with the total score ranging from 5 to 25. A score of less than 19 indicates that asthma is uncontrolled (Gibbons & Fitzpatrick, 2009; Nathan, et al., 2004; Shen, Johnstone & Hays, 2011). The internal consistency reliability of the 5-item ACT scale is 0.84 (Nathan et al., 2004).

The MiniAQLQ (Appendix H) measures the asthmatic’s quality of life (Juniper, 2012). MiniAQLQ is chosen for the project because it is a shorter version of the Asthma Quality Life Questionnaire (AQLQ), and it is an easier questionnaire for participants to answer (Juniper et al., 1999). It has 15 questions measuring the quality of life over two weeks with four health domains. The domains are activity limitations (question items 12, 13, 14, 15), symptoms (1, 4, 6, 8, 10), emotional function (3, 5, 9), and environmental stimuli (2, 7, 11). The scores for each domain range from 1 to 7 (7 indicating better quality of life) (Juniper et al., 1999; Olajos-Clow, et. al, 2010). A score of 1 indicates all the time; score of 2 indicates most of the time; score of 3 indicates a good bit of the time; score of 4 indicate some of the time; score of 5, a little bit of a time; score 6 indicates hardly any of the time, and a score of 7 points to none of the time. An average score of 15 shows asthma controls the participants’ life all the time; score of 30, asthma controls the participant’s life most of the time; score of 60, asthma controls the participant’s life
some of the time; score of 75, asthma controls the participant’s life a little bit of the time; score of 90, asthma controls the life of the participant hardly any of the time; and, a score of 105 shows asthma controls the life of the participant none of the time.

Juniper et al. (1999) reported that the MiniAQLQ was a reliable tool (intraclass correlation coefficient (ICC = 0.83). Construct validity (correlation with other indices of health status) was strong for both the MiniAQLQ and the AQLQ. Criterion validity showed that there was no bias between the instruments (p = 0.61), and the correlation between them was high (r = 0.90). The MiniAQLQ has worthy measurement properties, but they are not quite as strong as those of the original AQLQ.

The Asthma Journal Questionnaire (Appendix N) used in the KCAMP project was adopted from the Asthma Initiative of Michigan (AIM) (AIM, 2001). It provided assessment of the participants’ asthma condition, determined whether they had more or less asthma attacks, how much sleep they were having, the events and measurements of their peak flow at home.

Developed measurement tools. Participants’ asthma knowledge was measured using an existing assessment tool from the ALA, and was modified to suit the program’s objectives (Appendix J). The asthma knowledge test was administered to and collected from participants before and after the asthma education class, and at one month and three months post educational sessions. The original questionnaire is considered reliable in assessing asthma knowledge by ALA (ALA, 2012). Since it is modified, the questionnaire was pilot tested and administered to nursing students who received the asthma education in Summer 2015. The nursing students found that the asthma knowledge test questions were clearly written and understandable.
A pre and post-test tool of Asthma Skill Knowledge requires participants to answer the questions, “What do you use to manage your asthma?” and “Which is the most helpful in managing your asthma?” assisted in identifying interventions that the participants used prior to participating in the KCAMP sessions and which interventions they preferred. The tool also measured what participants felt were the most useful interventions used that improved their asthma self-management knowledge and practices (Appendix L). The interview questionnaire was also developed to identify the participants’ asthma statuses, knowledge and self-management practices (Appendix I). The different measurement tools for the project are represented in Table 4.

A portable blood pressure machine was used to obtain blood pressures. A simple handheld oxygen saturation machine and a digital weighing scale was utilized to obtain the participants oxygen saturations, heart rates, and weights. A carpenter’s tape measure measured participants’ heights. Height and weight measurements were collected to assist in calculating the participants’ FEV1 levels. Peak flow meters and a spirometry machine were used to collect PEF and FEV1 measurements.
Table 4

*Measurement Tools*

<table>
<thead>
<tr>
<th>Tools</th>
<th>References</th>
<th>Number of Items</th>
<th>Data Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma Skills Knowledge Pre and Posttest</td>
<td>Miguel, L. (2015). The Ka’u community asthma skills knowledge pre and post questionnaire [unpublished].</td>
<td>2 questions with 5 choices of answers.</td>
<td>Descriptive statistics: Percentages</td>
</tr>
<tr>
<td>Interview Questions, Oral Reports</td>
<td>Interview of participants and journal entries. Miguel, L. (2015). The Ka’u community asthma interview questions [unpublished].</td>
<td>Open 7 questions</td>
<td>Qualitative data to identify themes and also identify any increase or decrease in asthma attacks, and ER, office</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source</th>
<th>Data Collection Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma Journal Reports</td>
<td>Asthma Status, Number of Asthma Attacks, Number of ER, office and hospitalization visits.</td>
</tr>
</tbody>
</table>

**Timeline of the project.** The project proposal was defended and accepted by the graduate committee in June 2015. Key personnel and the Hui Mālama Ola Nā ‘Ōiwi staff were updated about the project shortly thereafter. Marketing products, advertising of the project training of staff, development of project activities and lessons, and the database were completed in July 2015. Implementation of asthma practice change, collection of data, data entry began in August 2015 and ended in December 2015. Data analysis and interpretation of data were conducted in January and February 2016. Oral defense was held on March 14, 2016. The project timeline is represented in Table 5.
Table 5

*Project Timeline*

<table>
<thead>
<tr>
<th>TASK</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Successful Proposal Defense</td>
<td>M J</td>
<td>J A</td>
</tr>
<tr>
<td>Brief Key Leaders &amp; Staff</td>
<td>MJ J</td>
<td>MN D</td>
</tr>
<tr>
<td>Develop Marketing Products</td>
<td>MJ J</td>
<td>M M</td>
</tr>
<tr>
<td>Train Staff</td>
<td>MJ J</td>
<td>M M</td>
</tr>
<tr>
<td>Develop Database</td>
<td>MJ J</td>
<td>M M</td>
</tr>
<tr>
<td>Implement Practice Change</td>
<td>MJ J</td>
<td>M M</td>
</tr>
<tr>
<td>Collect Data</td>
<td>MJ J</td>
<td>M M</td>
</tr>
<tr>
<td>Enter Data</td>
<td>MJ J</td>
<td>M M</td>
</tr>
<tr>
<td>Analyze Data</td>
<td>MJ J</td>
<td>M M</td>
</tr>
<tr>
<td>Interpret Data</td>
<td>MJ J</td>
<td>M M</td>
</tr>
<tr>
<td>Written Oral Defense</td>
<td>MJ J</td>
<td>M M</td>
</tr>
<tr>
<td>Prepare &amp; Submit Dissemination Products</td>
<td>MJ J</td>
<td>M M</td>
</tr>
<tr>
<td>Graduation</td>
<td>MJ J</td>
<td>M M</td>
</tr>
</tbody>
</table>

**Program evaluation plan.** Outcomes evaluation is an evaluation process that focuses on the immediate effects of the program (Issel, 2014). The intent of this evaluation was to determine the effects of the program in improving asthma self-management. The evaluation process sought to answer the question, “Did the program make a difference?” Therefore, the KCAMP was evaluated to identify whether the program made a difference in managing
participants’ asthma. A Logic Model illustrating the expected short-term, midterm and long-term outcomes can be found in Appendix P.

**Expected short-term outcomes.** In the short-term participants will: Increase their asthma awareness and knowledge; learn to incorporate and developed skills of asthma journaling or diary writing; use peak flow meter and spacers; change their attitudes of asthma by expressing confidence and advocating for others asthmatics; and, develop motivation for the self-managing of their asthma as evidenced by journal entries and reports (Appendix P).

**Expected medium-term outcomes.** In the medium-term participants will: include a change in asthma management behaviors; learn and adopt asthma practices; and possess a change in decision making for managing their asthma. Medium-term outcomes also include: recognition of KCAMP by practitioners; improved practices for asthma management in Ka’u; adoption of KCAMP guidelines by physicians and other organizations for teaching their patients in managing asthma; and decrease in emergency room visits, use of medications, asthma exacerbations and symptoms (Appendix P).

**Expected long-term outcomes.** The long-term outcomes of the project comprises of: Change in living condition where adults with asthma are healthier; transformation of social conditions where asthmatic adults are able to fully and meaningfully participate in family and community activities; improvement of economic conditions where asthmatic adults can increase their productivity resulting in increase of work attendance and decrease of medical costs; improvement of political conditions where public funding is secured for sustaining the program project for the community; and, changes in the health of the community by decreasing its asthma disparity (Appendix P).
The results of the evaluation will provide evidence that the program and its interventions can be used to help community asthmatics manage their asthma effectively. The evaluation results can be used to revise, justify, and sustain the program. The evaluation requirements are to determine whether asthma community education and self-management training made a difference in: asthma self-management knowledge, the participants’ quality of lives, participants’ lung function, and participants’ ACT (Appendix A) and MiniAQLQ scores (Appendix H).

**Evaluation outcomes and metrics.** The outcome evaluation was guided by the following:

Outcomes 1: Increase knowledge of asthma among asthmatic adults ages 18 and older who live in Ka’u through community asthma education.

Metric 1: Using pre and posttests Asthma Educational Knowledge Pre and Posttest (Appendix J): 1) All participants will be able to list at least one lesson that increased their knowledge in asthma by the end of the two hour educational session, 2) 50% of the participants will be able to adopt the lessons learned in managing their asthma within one month after receiving the asthma educational program and, 3) 80% of the participants will be able to adopt lessons learned in managing their asthma by the third month after participating in the asthma educational program

Outcomes 2: Improve quality of life by reducing asthma exacerbations in asthmatics adults ages 18 and older who live in Ka’u through self-management strategies training.

Metric 1: Using the pre and post-test ACT (Appendix A): 1) All participants from the program will self-report ACT scores at the beginning of the program before receiving asthma
management skills training, 2) At least 50% of the participants will score 19-25 on their ACT questionnaire within one month and, 3) A minimum 80% of the participants will score 19-25 on their ACT questionnaires at three months after participating in the asthma educational program.

Metric 2: Using the pre and post-test MiniAQLQ (Appendix H): 1) All participants from the program will self-report their MiniAQLQ at the start of the program prior to receiving the asthma management skills training, 2) At least 50% of the participants will score 60-105 on their MiniAQLQ within one month, and 3) A minimum 80% of the participants will score 60-105 on their MiniAQLQ by the third month after participating in the asthmas educational program.

Metric 3: Using Asthma Skills: Knowledge pre and post-test questions regarding intervention efficacy (Appendix L): 1) At least 50% of the participants will self-report which intervention was the most helpful in managing their asthma within one month, and 2) A minimum of 80% of the participants will self-report at three months after asthma education and asthma self-management training which intervention was the most helpful in managing their asthma.

Metric 4: By means of participant journal reports: 1) At least 50% of the participants will be able to list at the end of one month which interventions were the most and least helpful in managing their asthma, and their reasons for choosing each, and 2) A minimum of 80% of the participants will be able to list by the third month which interventions was most and least helpful in managing their asthma and their reasons for choosing each in their journal.

Outcomes 3: Reduce asthma exacerbations in asthmatic adults ages 18 and older who live in Ka’u through self-management strategies training.
Metric 1: Using spirometry and peak flow measurements: 1) All participants will have a baseline measurement of their FEV1 capacity at the start of the program prior to receiving asthma management education and skills training, 2) 50% of program’s participants will exhibit increased lung capacity levels or FEV1s at one month in the program, and 3) 80% of the program’s participants will show increased lung capacity or FEV1 at the end of the program.

Metric 2: Using spirometry and peak flow measurements participants will have: 1) decrease asthma exacerbations, 2) decrease number of office visits and, 3) decrease in number of emergency room visits. Table 6, illustrates the evaluation and outcome metrics used in the project.
### Table 6

**Evaluation and Outcome Metrics**

<table>
<thead>
<tr>
<th>Who</th>
<th>Outcomes (What)</th>
<th>Metric (What)</th>
<th>Data Collection Points (When)</th>
<th>Data Analysis (How)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>Increased in asthma management knowledge.</td>
<td>Asthma Educational Knowledge Pre and Posttest</td>
<td>Pre-educational session, immediately post educational session, one month and three months’ post-intervention.</td>
<td>Descriptive Statistics: Percentages</td>
</tr>
<tr>
<td>Participants</td>
<td>Improve quality of life.</td>
<td>ACT Pre and Posttests MiniAQLQ Pre and Posttest, Journal Reports and Interview Questions</td>
<td>Session1, and one month and three months’ post-intervention.</td>
<td>Descriptive Statistics: Percentages</td>
</tr>
<tr>
<td>Participants</td>
<td>Reduce asthma exacerbations.</td>
<td>Peak Flow Measurements, FEV1 Measurements</td>
<td>Session1, and one month and three months’ post-intervention.</td>
<td>Descriptive Statistics: Percentages</td>
</tr>
<tr>
<td>Participants</td>
<td>Number of participants reporting improvement of asthma by using learned management skills, visits in ER or doctor’s visits related to asthma, and number of asthma attacks.</td>
<td>Oral Reports Interview Questions Tool Journal Entries and questionnaire</td>
<td>Throughout each session, One month and three-months post-implementation.</td>
<td>Identification of themes (qualitative approach).</td>
</tr>
</tbody>
</table>
**Data analysis.** Data analysis is an important step in evaluating the meaning of results (Burns & Grove, 2009). The data analysis was conducted to give meaning to the results obtained from the data collected. The purpose of the data analysis was to determine the clinical significance of the KCAMP project’s intervention in improving asthma awareness, knowledge and self-management, and decrease asthma exacerbations.

Data analysis primarily involved using descriptive statistics, and percentage change over time. Percentages are easy to interpret, are more understandable and are a good way to show relationships and comparisons between categories of responses (Burns & Groves, 2009; Taylor-Powell, 1989). Results reported in-percentages suggest it easier for participants, Hui Mālama Ola Nā ʻŌiwi, community members, KRHCAI members, ALAH, and other stakeholders to understand. Percentages may be compared to demonstrate differences in asthma knowledge, asthma status, lung status, quality of life, asthma interventions of the participants before and after receiving the KCAMP.

Qualitative analysis consisted of finding themes from unstructured diaries where participants record thoughts and feelings (Burns & Grove, 2009; Issel, 2014). Thematic content analysis of the qualitative data and participants’ self-reports were undertaken. The process of coding the qualitative data involved independent coding, followed by the generation of themes from similar concepts in the data.

**Interpretation and sharing of results.** In the interpretation and sharing of information, trained staff were utilized to assist in finding and sharing the results of the project. The results of the project were shared among participants and stakeholders through formal and informal meetings and through written reports. Descriptive statistics was used to interpret the knowledge,
quality of life and lung capacity of the participants. Participant pre and post-test knowledge scores were compared and evaluated for the percentage of participants answering correctly or incorrectly. To determine whether there are increases in knowledge, 80% of the participants answered correctly in all 15 questions at three months of receiving the asthma educational class.

The ACT pretest and post-test scores were compared to interpret the participants’ quality of life. The percentages of participants scoring 19-25 (controlled), and less than 19 (uncontrolled) in their pre and post-tests was quantified. To determine whether an increase in the quality of life exists, it was expected that 80% of the participants will score 19 and above.

The MiniAQLQ was utilized to interpret the participants’ quality of life. The pre and post-test scores from MiniAQLQ were compared. The percentage of participants scoring 7 (none of the time) were evaluated, this number value is the highest score for each question in all of the 15 questions on their MiniAQLQ pre and post-tests. It was anticipated that 80% of the participants score 7 in all of the 15 questions three months’ post intervention to show whether an increase in their quality of lives were achieved.

To evaluate change in participants’ lung capacities, the FEV1 and peak flow measurements were analyzed and compared to determine whether the participants had an increase of FEV1 and peak flow measurements. It was anticipated that 80% of the participants showed an increase from their baseline peak flow levels and FEV1 on the third month post intervention.

**Human subjects’ considerations.** This project was designed to protect the rights of the human subjects involved with the project. This project was also designed as a QI program and not as a research study. There were no plans to randomize subjects to create different treatments
or vulnerable populations. Standard, evidence-based asthma practices was implemented and data was reported as an aggregate of the population.

Ethical principles in research with humans’ subjects are autonomy, non-maleficence, beneficence, and justice (Frey, Veatch & Taylor, 2011). This project utilized these principles. There were no additional risks beyond the standard asthma practice, and since this was an improvement of practice, this project had the potential to benefit participants. Confidentiality was maintained by assigning code letters and numbers to individual participants. Names were not accessible on transcribed or written notes. All Ka’u community adult members who have asthma were invited to join the program and had an equal opportunity to attend the program.

The Hui Mālama Ola Nā ‘Ōiwi project director and project managers reviewed the project and gave their support of the project. This project leader took the University of Hawai’i’s required Collaborative Institutional Initiative (CITI) Course in Human Subjects Protection (CITI, 2014) and National Institute of Health (NIH) Office of Extramural Research Web Training. This project was reviewed by a committee comprising of faculty and clinical experts to ensure adequate human subjects protection was present.

**Limitations.** Despite efforts in adjusting for risks, not all participant characteristics were controlled. The impact of the practice change may have been limited by a small sample size. Additionally, allowing only one month for the implementation phase may have not allowed adequate time for fully engaging the participants. Lastly, the use of three untested instruments may have limited the interpretation of the findings.

**Summary.** Chapter 3 explained the methodology selected for the asthma evidence-based practice project. Guided by the ACE Star Model point 3, translation into guidelines and point 4,
practice integration, Chapter 3 included the objectives and purpose statement, the description of innovation or practice change, definitions, the sampling plan, data collection procedures, program evaluation plan, and the consideration and protection of human rights.

Asthma is a serious health condition that affects many individuals in Ka’u. It is a disease that is characterized by recurrent attacks of breathlessness and wheezing which vary in severity and frequency from person to person. The negative effects of asthma on its sufferer’s not only distress the well-being of the individuals, but affect socio-economic factors. Asthmatic adults often experience increase in health care costs, lost in productivity, reduction of participation in daily activities, and decreased quality of life.

Understanding asthma and creating plans for the improvement of its management is needed in Ka’u. It is also imperative that asthma exacerbations are controlled, and that asthma’s prevalence among adults is decreased in this community. The KCAMP is an important project that can provide the skills needed to improve asthma management and the quality of lives of adults with asthma in Ka’u. This project has the potential to improve the community’s current awareness of asthma, and help decrease the prevalence of the disease while providing information for other community health care providers. The methods and evaluation tools described in this chapter were used to achieve the project’s objectives.
CHAPTER 4. RESULTS

Point 5, Process, Outcome and Evaluation

Introduction. Chapter 4 represent the Point 5, Process, Outcome and Evaluation of the ACE Star Model. The KCAMP project was implemented from August to December 2015. A change in asthma practice was observed and collected in the five-month time period. This chapter provides the project’s objectives, description of sample, trend analysis for process and outcome variables, and evolution of the project.

Objectives. The primary objective of the DNP asthma management project is to improve asthma practices and decrease asthma exacerbations for people with asthma in the Ka’u District. The KCAMP EBP project consisted of community-based asthma education and self-management skills including: Self-monitoring, an asthma action plan, oral reports, journaling, and use of peak flow meters and spacers.

Description of sample. Fourteen adults (n=14) participated in the KCAMP program. The demographics characteristics of the participants varied. All participants reported being diagnosed with asthma. The ages ranged from 28 to 75 years old, the average was 56, and the median was 50. The participants were divided into four age groups. Fourteen percent (n=2) ranged between 20 and 35 years old, 29% (n=4) were between 36 and 51 years old, 14% (n=2) were between 52 and 67 years old, and 43% (n=6) were between 68 and 83 years old. Figure 4 illustrates the ages of the total population sample.

Those that participated in the group sessions (n=9) were aged 50 to 75 years old. There were 21% (n=3) in their 50’s, 29% (n=4) in their 60’s and 14% (n=2) in their 70’s.
The participants in the one-on-one sessions (n=5) were 28 to 50 years old. There were 14% (n=2) in their 20’s, 7% (n=1) in their 40’s and 14% (n=2) in their 50’s. Table 7 illustrates the ages of the individuals that participated in the group sessions versus participants who had one-on-one meetings.

![Demographics: Age of the Entire Sample](image)

**Figure 4.** Demographic: Ages of the entire sample.

**Table 7**

**Ages of Participants in the Group versus in the One-on-One Sessions**

<table>
<thead>
<tr>
<th>Ages</th>
<th>Group: Number of Participants (n=9)</th>
<th>One-on-one: Number of Participants (n=5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20s</td>
<td>0</td>
<td>14% (n=2)</td>
</tr>
<tr>
<td>30s</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>40s</td>
<td>0</td>
<td>7% (n=1)</td>
</tr>
<tr>
<td>50s</td>
<td>21% (n=3)</td>
<td>14% (n=2)</td>
</tr>
<tr>
<td>60s</td>
<td>29% (n=4)</td>
<td>0</td>
</tr>
<tr>
<td>70s</td>
<td>14% (n=2)</td>
<td>0</td>
</tr>
</tbody>
</table>
The total group consisted of 64% (n=9) female and 36% (n=5) male (Figure 5). There were 43% (n=6) female and 21% (n=3) male from the group participants. Participants in the one-one-one sessions were 21% (n=3) female and 14% (n=2) male. The majority of the participants were Hawaiian, 72% (n=10), 7% (n=1) were Caucasian and 21% (n=3) were Asian. In Figure 5, the gender and ethnicity of the participants are illustrated.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Female</th>
<th>Male</th>
<th>Hawaiian (Part)</th>
<th>Caucasian</th>
<th>Asian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentages of Participants</td>
<td>64</td>
<td>36</td>
<td>72</td>
<td>7</td>
<td>21</td>
</tr>
</tbody>
</table>

*Figure 5. Demographics: Gender and Ethnicity of the Entire Sample (N=14)*

All participants lived in the Kaʻu District. Fourteen percent (n=2) lived in Oceanview, 36% (n=5) in Naʻalehu, 29% (n=4) in Pahala, and 21% (n=3) resided in Volcano.

A survey of the participants’ educational level showed: 42.9% (n=6) finished high school, 14.3% (n=2) attended two years of college, 21.4% (n=3) attended four years of college, 14.3% (n=2) attended graduate school, and 7.1% (n=1) did not answer.

In the Asthma Demographic Survey (Appendix F) administered at the onset of this project, 14% (n=2) of the participants reported that their asthma was well controlled, 65% (n=9)
reported their asthma was somewhat controlled, 14% (n=2) reported their asthma were poorly controlled, and 7% (n=1) of the participants did not answer.

According to the demographic survey of what participants wanted to learn in the KCAMP project (Appendix F), 71% (n=10) wanted to learn about medications, 86% (n=12) wanted to know about treatments, 79% (n=11) wanted to know about spacers, 57% (n=8) of the participants wanted to know about peak flow meters, 57% (n=8) of the participants wanted to know about spirometry, and 57% (n=8) of the participants wanted to know of any alternative treatments.

**Trend analysis for process and outcome variables.** The primary objective of the project was to determine whether community-based asthma education and self-management training can reduce asthma exacerbations, decrease doctors ’office and emergency room visits, decrease hospitalizations, and improve quality of life. Because of the primary objective of the project, the trends in the process and outcome variables were analyzed as one total group.

**Process outcomes.** Process measures evaluate whether activities of the program were implemented as planned. The project’s timeline was followed. Designing of teaching materials and classes, meetings with staff, recruitment of volunteers, training of staff and volunteers, recruitment of participants and implementing the project activities were executed as planned.

The KCAMP staff and volunteers communicated via email, in person and through phone to arrange, coordinate and evaluate the activities of the program. Folders for each participant containing materials for each session were assembled prior to each session. The participants in the group sessions were shuttled to the meeting location by van and arrived on time, at 08:30 a.m., as planned. Staff and volunteers performed their assigned duties during each session.
Participants were able to follow instructions and formed a routine. They learned to sign in on the attendance checklist (Appendix G) before having their blood pressures taken, and immediately collected their breakfast items before each session officially began. While the participants registered, the staff engaged the participants in informal conversations to assess and determine their asthma statuses. Each session was two hours long, and at the end of the session the participants were driven home by one of the staff members.

For the one-on-one meetings, this DNP student contacted the five participants individually to schedule home visits. The participants also signed in on the attendance sheet (Appendix G). Folders containing the lessons were given to each participant before the session started. The one-on-one sessions lasted three or more hours. The spirometry instrument was not available for the one-month post-implementation for both groups and the one-month post implementation FEV1 measurements were not collected as planned.

**Outcome 1 results: Increase knowledge.** An increase in knowledge of asthma was reported in the asthmatic adults recruited in the project.

**Metric 1: Results of the asthma educational knowledge (Appendix J) pre and posttest.** All or 100% (n=14) of the participants were able to list at least one lesson that increased their knowledge of asthma at the end of the two-hour educational session. Among the lessons listed of having greater knowledge by the participants were: Asthma action plan, asthma peak flow, asthma journaling, knowing signs and symptoms of asthma, medication adherence, stress management and reduction of environmental triggers.

At the one-month post educational session, 100% of the participants reported that they adopted at least two lessons learned in managing asthma. All or 100% (n=14) reported that they
decreased their environmental triggers such as cleaning their house regularly, handwashing, avoiding the use of perfumes, avoiding places where there were smokers, limiting outdoor activities when the vog was heavy, taking their medications and using their peak flow meters.

At three months 100% (n=14) of the participants adopted using peak flow meters, reduced environmental triggers, used their spacers, decreased emotional stress and recognized the signs and symptoms of asthma. Of these, 50% (n=7) used journaling. Twenty-one percent (n=3) continued to believe that asthma medications are addictive and only used their inhaler when wheezing.

_Asthma Pre and Posttests results comparison._ The asthma knowledge scores are illustrated in Figure 6. The pretest and post-tests scores post educational session were compared, and showed that 43% percent (n=6) of the participants answered the questions correctly and increased knowledge; 50% (n=7) did not, and 7% (n=1) had a decrease in knowledge.

The one-month answers to the questionnaire were compared to posttest answers previously reported. The results showed that 64% (n=9) of the participants increased their asthma knowledge scores 14% (n=2) decreased, and 21% (n=3) maintained their asthma knowledge.

The three-months posttest results were compared to the one-month posttest results which showed 93% (n=13) of the participants increased their asthma knowledge score and 7% (n=1) did not increase their asthma knowledge. Figure 7 illustrates the participants’ Asthma Educational Knowledge Questionnaire (Appendix J) scores.
Figure 6. Asthma Knowledge: Educational session pre- and post-tests scores.
Figure 7. Percentages showing increased, decreased or maintaining asthma educational knowledge.

**Outcome 2 results: Improved quality of life.** The participants improved their quality of life by reduction of asthma exacerbations.

**Metric 1: ACT (Appendix A) scores results.** Table 8, is a list of the participants ACT scores. Using the pre and posttest results: 1) All program participants reported their ACT scores at the beginning of the program before receiving the KCAMP educational sessions. Of the participants, 57% (n=8) had uncontrolled asthma and scored less than 19 on their ACT pretest, 43% (n=6) revealed they had a controlled asthma and scored more than 19 on their ACT pretest.

At one month, 79% (n=11) of the participants reported controlled asthma and scored more than 19 on their ACT post-test. Of the participants, 21% (n=3) reported uncontrolled asthma and scored less than 19 on their ACT test. At three months, 100% (n=14) had controlled asthma and scored 19 and more on their ACT post-test. Figure 8 illustrates the percentages of participants ACT scores with controlled or uncontrolled asthma at one month and three months pre and post-implementation.
Table 8

ACT Scores of the Participants

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Figure 8. Percentages of participants ACT scores with controlled or uncontrolled asthma at one month and three months pre and post-implementation.

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**Metric 2: MiniAQLQ scores (Appendix H) results.** Increased scores in the MiniAQLQ indicate that the participants had a better quality of life with asthma. Figure 9 illustrates participants’ MiniAQLQ scores. 1) All participants self-reported their MiniAQLQ scores at the beginning of the program, 50% (n=7) scored 60-105 which indicate asthma controlled their life some of the time to none of the time in 2 weeks, 2) In one month, 93% (n=13) scored 60-105 on their MiniAQLQ posttest and 7% (n=1) scored less than 60 (participant number 14, scored 31) and, 3) 93% (n=13) scored 60-105 and 7% (n=1) scored less than 60 on their MiniAQLQ by the third month after participating in the asthma educational program. Figure 10 illustrates the percentages by which the participants increased, decreased and maintained their pre, one-month and three-months’ post-implementation MiniAQLQ scores.

*Figure 9. MiniAQLQ scores.*
Figure 10. Comparison of MiniAQLQ Scores

Results of MiniAQLQ by Domains

- MiniAQLQ Symptoms domain (questions 1, 4, 6, 8 and 10). Figure 11 shows the percentages that participants increased, decreased and maintained their one-month and three-months’ post-implementation MiniAQLQ scores by symptoms domain. An increased score in this domain represented the number of participants that had increased control of their asthma symptoms, decreased shortness of breath, were less bothered by coughing, had less feeling of chest pain, showed less difficulty sleeping at night, and were wheezing less in the 2 weeks. At one month, 93% (n=13) of the participants increased, and 7% (n=1) decreased their MiniAQLQ scores by symptoms domain. At three months, 86% (n=12) increased their
MiniAQLQ scores, 7% (n=1) decreased and 7% (n=1) maintained their MiniAQLQ scores by symptoms domain.

![Comparison of MiniAQLQ Symptoms Domain Scores](chart)

**Figure 11.** Comparison of participants’ MiniAQLQ scores by symptoms domain.

- MiniAQLQ Activity limitation domain comprised of questions 12, 13, 14, and 15. An increased score in this domain represented the number of participants that increased activity such as the ability to attend social activities and work in the past 2 weeks. At one month, 64% (n=9) of the participants increased, 21% (n=3) decreased, and 14% (n=2) maintained their MiniAQLQ scores by activity limitation domain. At three months, 86% (n=12) increased, and 14% (n=2) maintained their MiniAQLQ scores by activity limitation domain. Figure 12 illustrates the number of participants who increased their scores by activity domain.
MiniAQLQ Emotional Function Domain comprises questions 3, 5 and 9. Increased scores in this domain indicate that the participants were less frustrated, afraid, and/or concerned about their asthma. At one month, 71% (n=10) of the participants increased and 29% (n=4) maintained their MiniAQLQ scores. At three months, 86% (n=12) increased, 7% (n=1) decreased and 7% (n=1) maintained their MiniAQLQ scores. Figure 13 illustrates the percentages of participants who increased, decreased and maintained their MiniAQLQ scores on emotional function domain.
Figure 13. Comparison of participants’ MiniAQLQ scores by emotional function domain.

- MiniAQLQ Environmental Stimuli Domain consisted of questions 2,7 and11. An increased score in this domain indicated that participants felt less bothered by dust, cigarette, and weather conditions. At one month, 86% (n=12) of the participants increased, and 14% (n=2) maintained their MiniAQLQ scores by environmental stimuli domain. At three months, 57% (n=8) increased, 29% (n=4) maintained their MiniAQLQ scores and 14% (n=2) decreased their MiniAQLQ scores by environmental stimuli domain. Figure 14 illustrates the percentage of participants whose scores increased, decreased and maintained at one and three months’ post-implementation by environmental stimuli domain.
Figure 14. Comparison of participants’ MiniAQLQ scores by environmental domain.

**Metric 3: Asthma skills knowledge (Appendix L) pre and posttest intervention efficacy results.** During the pre-implementation of asthma skills management, pretest results revealed 64% (n=9) of the participants reported that education was number one or most helpful in managing their asthma, 21% (n=3) reported asthma action plan was second most helpful, (14%, n=2) claim verbalization was the third best, and 7% (n=1) reported spacers was the fourth best and peak flow meter was rated zero. The posttest results showed 64% (n=9) of the participants reported education was their number one or most helpful in managing their asthma, 29% (n=4) reported spacers were their second best, 21% (n=3) reported asthma plan was their third best, 7% (n=1) reported peak flow meter and 7% (n=1) reported verbalization were each at fourth best.

At one month, 100% (n=14) of the participants self-reported which intervention was the most helpful in managing their asthma. Of the participants, 64% (n=9) reported education was their number one or most helpful in managing their asthma, 36% (n=5) reported spacers were the second most helpful, 29% (n=4) reported asthma plan and 29% (n=4) peak flow meter were their
third most helpful, and 21% (n=2) reported verbalization was the fourth most useful in managing their asthma.

At three months all or 100% (n=14) of the participants reported which intervention was most helpful in managing their asthma. Of the participants, 71% (n=10) reported education was their number one or most helpful, 36% (n=3) reported peak flow use was their second most helpful, 29% (n=4) chose asthma action plan was their third most helpful, 21% (n=3) chose spacers was their fourth most helpful, and 14% (n=2) reported verbalization was their fifth or least helpful intervention in managing their asthma. Figure 15 illustrates the percentages of the participants’ preferences of asthma intervention.

![Asthma Intervention Preferences (N=14)](image)

*Figure 15. Percentages of participants’ preferences of asthma intervention.*
Strategies participants used to manage their asthma:

- **Inhaler.** Of the participants, 93% (n=13) used inhaled medications to manage their asthma at the beginning of the program, and at one month after receiving the KCAMP asthma education and asthma self-management skills training. At three months, 100% (n=14) of the participants used inhaled medications to manage their asthma (Figure 16).

- **Spacers.** Of the participants, 64% (n=9) used spacers with their inhaled asthma medications at the beginning of the program. At one month, 79% (n=11) used spacers to take their asthma inhaled medications, and at three months, 100% (n=14) used spacers while taking their inhaled asthma medications (Figure 16).

- **Peak Flow Meters.** None (0%) of the participants used peak flow meters in managing their asthma at the beginning of the program. At one and three months after participating in the project, 100% (n=14) of the participants reported using peak flow meters to manage their asthma (Figure 16).

- **Recognition of asthma triggers.** Of the participants, 50% (n=7) reported that recognizing their asthma triggers was used to manage their asthma before taking part in the KCAMP program. At one month, 93% (n=13) reported recognizing their asthma triggers was used to manage their asthma. At three months, 100% (n=14) of the participants reported recognizing their asthma triggers was used in managing their asthma (Figure 16).

- **Stress management.** Of the participants, 64% (n=9) used stress management to manage their asthma before taking part in the KCAMP program. At one month,
86% (n=12) of the participants reported using stress management to manage their asthma, and at three months, 93% (n=13) reported stress management was used to manage asthma. The participants reported walking, singing and deep breathing for decreasing their stress levels (Figure 16).

- Asthma medications. Of the participants, 50% (n=7) reported that medications were used to manage their asthma before the KCAMP project. At one month, 76% (n=11) reported using medications to manage their asthma, and at three months, 86% (n=12) reported using medications to manage their asthma (Figure 16).

![Figure 16. Strategies participants used to manage their asthma.](image)

Metric 4: Journal reports results. At one month, 50% (n=7) of the participants were able to list which interventions were the most and least helpful in managing their asthma, and their
reasons for choosing each. All 7 of the participants wrote in their journals that journaling was the least helpful in managing asthma. The participants reported that the most helpful for managing their asthma was recognizing their triggers and taking their medications and resting. At three months, 14% (n=2) of the participants listed that journaling was the most helpful in managing their asthma.

**Outcomes 3 results: Reduction of asthma exacerbations**

*Metric 1. Spirometry results and peak flow meters.* Baseline peak flow and FEV1 were collected from all of the participants (n=14) at the beginning of the program. Figure 17 illustrates the participants’ peak flow meter values/measurements. Figure 18 shows the participants FEV1 spirometry measurements.

Of the participants, 64% (n=9) increased and 14% (n=2) maintained their peak flow measurements in one month. At three months, 86% (n=12) increased, 7% (n=1) decreased and 7% (n=1) maintained their peak flow measurements. FEV1 (L/sec) measurements were not taken due to the unavailability of instrument in the one-month post-implementation. At three months, 64% (n=9) increased and 36% (n=5) decreased their FEV1 levels at the end of the program. Figure 19 illustrates the percentages of participants who increased their peak flow and FEV1 measurements at one and three months.

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**Figure 17.** Participants’ individual peak flow measurements.

**Figure 18.** Participants’ spirometry measurements.
Figure 19. Participants’ peak flow and spirometry measurements.

**Metric 2. Results of FEV1, peak flow and interview questions.** Of the participants, 86% (n=12) increased their peak flow meter values, and 64% (n=9) increased their FEV1 levels. Their interview questions also revealed decreased asthma exacerbations. The results of the oral, and interview questionnaire (Appendix I) are as follows and illustrated in Figure 20:

- Asthma attacks. Interviews conducted during the orientation sessions revealed that 43% (n=6) of the participants experiencing asthma attacks. Of this group, 14% (n=2) of the participants were having asthma attacks twice a day for two weeks, 14% (n=2) were having asthma attacks twice in two weeks, and 14% (n=2) were having asthma attacks almost every day throughout the two weeks. Interviews conducted at the one-month follow-up session showed that 7% (n=1)
of the participants were still having asthma attacks twice a week, 7% (n=1) one
participant had the flu and had three asthma attacks in one month, 7% (n=1) had
an asthma attacks almost every day, improved, and reported two asthma attacks in
one month. Twenty-one percent (n=3) reported no asthma attacks during the
orientation session, but reported one asthma attack in one month. Participants that
were still experiencing asthma attacks in one month were 43% (n=6). At the
three-month follow-up, 14% (n=2) had one asthma attack within the month, and
14% (n=2) reported two asthma attacks in one month, and 29% (n=4) were still
having asthma attacks. There was a 14% (n=2) decrease in asthma attacks in
three months which was an improvement in the quality of life among the
participants.

- Number of office visits due to asthma. Interviews conducted during the
  orientation session revealed that 43% (n=6) of the participants visited their
doctors at least twice a month because of their asthma. None (0%) of the
participants reported having visited their doctors because of asthma exacerbations
at the one-month and three-month sessions. An average charge of doctors’ visit
was estimated $104 per visit (Hawaii Asthma Initiative, 2013). The results of the
KCAMP saved the participants $104 per person per visit.

- Emergency room (ER) visits and hospitalization due to asthma. Interview
  conducted during the orientation session revealed that 14% (n=2) of the
participants were hospitalized because of asthma, 7% (n=1) of the participants
visited the emergency room because of asthma exacerbations six months prior to
attending the KCAMP. None (0%) of the participants reported having to visit the emergency room or were hospitalized because of asthma exacerbations at the one-month and three-month follow-up.

**Figure 20.** Percentages of participants’ asthma attacks, doctor’s visits and ER visits.

**Qualitative Data: Themes.** Themes emerged from the participants’ informal interviews, and answers from the semi-structured interview (Appendix I), journal questionnaires (Appendix N) and participants’ journal entries. Major ideas were related to the participants’ perceptions of how they were feeling and how information received in the previous KCAMP session were applied.

**First Session for the group and one-on-one.** At orientation session the participants reported that their asthma controlled their lifestyle and frustrated them. They reported that asthma exacerbations occurred when sick, were stressed, or when vog was present. Participants reported difficulty in sleeping because of shortness of breath and wheezing. The participants conveyed drinking hot tea, taking hot showers, going to the beach, and drinking caffeinated soft
drinks helped decrease their asthma symptoms, loosened their mucus, stopped their wheezing and helped them breathe easier.

**Second session for the group.** The participants reported that vog, perfumes, smoking, molds and animal dander were their asthma triggers.

**Third session for the group and one-on-one.** The participants described feeling better, taking deeper breaths, and knowing their asthma triggers.

**Fourth session or one-month post implementation for group and one-month post implementation or third session for one-on-one.** The participants shared that life was good in general, family members and friends were more aware of their asthma, were taking their peak flow measurements, took their flu vaccinations, filled and were taking their maintenance asthma medications, knew more about their condition, and were singing better and breathing easier. One participant reported that his asthma worsened and was unable to find his medications which his recently deceased wife stored away. Oral reports showed that 36% (n=5) of the participants having taken out carpeting from their bedrooms, 86% (n=12) reported cleaning their houses and avoiding perfumes helped decreased their asthma attacks. Of the participants, 7% (n=1) believed asthma medications were addictive and inhaled steroids had the same effects as steroids taken by mouth.

**Fifth session or three months’ post implementation for group and three months’ post implementation or fourth session for one-on-one.** The participants expressed their gratitude for helping them manage their asthma, and all the participants requested to have more asthma classes. Two of the participants reported that using spacers while taking their inhaled medications helped them to taste their food, made their throats feel better and hold notes longer.
while singing. Three of the participants expressed that they did not want to take their medications regularly, and only wanted to take their medications when they have an asthma attack. Drinking hot tea or soda, taking a hot shower, walking, and going to the beach were alternatives that the participants wanted to continue.

**Other Findings.** Data gathered from weight, blood pressure, heart rate, respiration and oxygen saturation were also examined. There was no significant weight gain recorded among the participants at the one-month and three-months post-implementation. The participants average weight was 178.31 pounds, the minimum was 130 pounds and the maximum was 234 pounds. Blood pressure, heartrate, respiration and oxygen saturation levels were collected from the participants as a requirement of all Hui Mālama Ola Nā ʻŌiwi’s clients. The data was examined and it was found that blood pressures were slightly high averaging 140/90 for three participants who were on blood pressure medications. However, these participants reported that these were their normal values and took their high blood medications before coming to class. The participants’ blood pressures ranged from 110/61 to 140/90. The average heartrate was 79 beats per minute (bpm), the minimum was 51 bpm and the highest was 95 bpm. The respiration of the participants ranged from 20 to 24 breaths per minute. There were no complaints from the participants of any chest pain of difficulty in breathing. The participants’ oxygen saturation levels ranged from 93% to 100%.

**Evolution of the Project**

**Expected versus actual outcomes.** The participants had a 64% (n=9)-increase in their knowledge of asthma, more than the expected increase of 50% at one month and 93% (n=13) increased their knowledge of asthma which was more than the expected increase of 80% at three
months after receiving the asthma education. The participants’ reported quality of life improved more than expected, and 79% (n=11) of the participants increased their ACT score (Appendix A) at one month and 100% (n=14) of the participants increased their ACT score (Appendix A) in three months. According to the participants’ scores on their MiniAQLQ (Appendix H) their quality of life also improved with 93% (n=13) of the participants increasing their MiniAQLQ scores at one and three months. The participants were able to report which intervention was most helpful in managing their asthma. Half or 50% of the participants did not write in their journals, and the expected outcome for this intervention was not achieved. In the pre and posttest Skills Knowledge Interventions all participants or 100% (n=14) listed their most helpful interventions which exceeded the expected outcome of 50% in one month and 80% in three months. As expected, there were decreased asthma exacerbations, emergency and doctor visits.

The baseline and three-month FEV1 measurements were compared. Of the participants, 64% (n=9) increased their levels and exceeded the expected outcomes of 80% at three months. Using peak flow meters, 64% of the participants at one month, and 86% at three months increased their forced expiratory volume (FEV) and exceeded the expected outcome of 50% at one month and 80% at three months. Table 9 details the expected versus actual outcomes of the listed metrics.
Table 9

*Expected vs Actual Outcomes*

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<td>80</td>
<td>93</td>
</tr>
<tr>
<td>Skills Knowledge</td>
<td>Most Helpful Intervention</td>
<td>50</td>
<td>100</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>Peak flow</td>
<td>Increased Level and Scores</td>
<td>50</td>
<td>57</td>
<td>80</td>
<td>86</td>
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<tr>
<td>FEV1 Spirometry</td>
<td>Increased Level and Scores</td>
<td>50</td>
<td>64</td>
<td>80</td>
<td>86</td>
</tr>
</tbody>
</table>

The expected short-term outcomes of the project such as increase in asthma awareness and knowledge, learning to incorporate and developing the skills of using peak flow meters and spacers, and changes in attitudes about asthma by expressing confidence and advocating for other asthmatics were achieved. However, only 50% (n=7) of the participants used journal keeping in managing their asthma.

The participants’ interview reports and journal entries showed evidence that the expected medium term of change in behavior, learned and adopted asthma practices and changes in
decision making in managing asthma were fulfilled. The project’s long-term outcomes were not measured.

**Facilitators.** The project’s activities were implemented by the facilitators as planned. Creating and designing the program, staff training, recruiting participants, providing community-based asthma education and self-management strategies/skills training and collection of data were conducted as planned and as scheduled. There was one additional session in the third month post-implementation. This added session was conducted to collect data from the participants that could not attend the three-month session due to conflicts in schedule.

**Barriers.** Barriers were identified prior to, during and post-implementation. There were several hurricane watches and warnings while the program was being implemented which caused some scheduling conflicts. Though none directly hit the Big Island, these were strong enough to impact the local weather in terms of strong winds, flooding and heavy rain, causing transportation issues and breaks in communication lines.

There were occasions when participants could not attend the sessions because of conflict in schedules. Some participants cancelled because of personal reasons. Residences in remote locations having unpaved roads, no internet or electric connections were safety and communication issues as it made it difficult for this author to make home visits with these participants.

**Summary**

The project was guided by the ACE Star Model and used the community participatory approach. The project was conducted over a course of five months. Fourteen participants received asthma educational classes and asthma self-management skills training. During that
time the participants answered demographics surveys, interview questions, journal questions and engaged in journal writing. Peak flow and FEV1 measurements were collected from the participants. Pre and posttest of ACT (Appendix A), MiniAQLQ (Appendix H), Asthma Educational: Session Knowledge (Appendix J), and Asthma Skills Knowledge (Appendix L) were administered and collected from the participants. The following results and outcomes were observed:

- An increase in participants’ asthma knowledge with the asthma educational session at one month and at three months’ post implementation.
- A change in participants’ behavior with asthma management skills training by participants adopting asthma strategies to manage their asthma at one month and at three months.
- An improvement in participants’ quality of lives with an increase of their ACT and MiniAQLQ scores at one month and at three months.
- An increase in participants’ activity reported in the MiniAQLQ activity domain scores at one month and at three months.
- An increase in participants’ environmental awareness such as eliminating and recognizing their asthma triggers.
- A decrease in participants’ asthma symptoms reported in the MiniAQLQ symptoms domain scores at one month and at three months.
- A reduction in participants’ asthma exacerbations with asthma educational, asthma management skills, the use of spacers and peak flow meters at one month and at three months.
• A reduction in participants’ asthma exacerbations or attacks with the use of peak flow meters at one month and at three months.

• An increase in participants’ FEV1 measurement with asthma educational and management training at one month and at three months.

• A decrease in the number of office visits due to asthma, and the absence of emergency room visits with asthma educational and skills management training at one month and at three months.

• Unexpected results reported in improvements of breathing, singing, tasting and a diminished occurrence of sore throat.

• A number of participants that still avoided taking asthma medications regularly.

• Strategies that all the participants used in managing their asthma were combination of inhaler, spacers and peak flow meters and recognizing triggers.

The primary objective of the DNP project, to improve asthma practices and decrease asthma exacerbations in the Ka’u district was realized.
CHAPTER 5. DISCUSSION

This chapter was guided by point 5 of the ACE Star Model of Knowledge - Transformation. The DNP project was created with the goal of reducing asthma exacerbations and improving healthcare outcomes using evidence-based practices of a community asthma management program. The projects objectives were to improve asthma practices and decrease asthma exacerbations in asthmatics residing in the Ka’u District. Asthma has no cure and has debilitating effects which can impact the mental, physical and socio-economic aspects of the population. For these reasons, it is imperative to provide asthma community education and asthma self-management training.

The literature review provided evidence that community-based asthma education and self-management such as self-efficacy, an asthma action plan, journal writing, and the use of peak flow meters’ decreases asthma exacerbations. These evidence were known to limit emergency room and doctor visits, and improve the quality of life for adults living with asthma. Due to these factors, the DNP project focused on increasing asthma knowledge, developing self-management skills and strategies, and changing asthma behaviors in participants.

Ka’u has been identified to have the highest number of adults suffering from asthma. The HBRFSS 2013 results reported the number of adults with asthma in Hawai’i county was 149,215, with 44,134 living in the Puna and Ka’u districts (Nguyen & Savail, 2013, p. 77). In addition, Ka’u is a rural area with limited access to healthcare and health care providers. This area is in the direct wind flow of the active Kīlauea Volcano’s emissions and vog. These reasons coupled with the absence of an asthma management program in the district made it imperative to develop this program for the people of Ka’u.
A partnership was established with Hui Mālama Ola Nā ‘Ōiwi to provide a Ka’u Community Asthma Management Program (KCAMP) for adult clients with asthma. This DNP project created KCAMP which was piloted in August 2015. There were nine participants who attended the group sessions and completed the program. In addition, five participants were recruited from the community, and had one-on-one asthma sessions. These five participants had four asthma sessions where orientation and asthma educations sessions were combined.

A demographics survey administered at the start of the program showed that the majority of the participants were Hawaiian, 72% (n=10) of the sample population. Pre and posttests were used to assess participants’ asthma knowledge, quality of life, self-management strategies and asthma conditions assessing whether their asthma were controlled or uncontrolled. Participants interview and journal questions, and journal entries were also evaluated. They were used to identify the quality of life, and change in behaviors in managing their asthma. Baseline and post-implementation peak flow and FEV1 measurements were also collected and compared to determine if the participants would increase their peak flow and FEV1 levels.

The KCAMP was implemented with a few identified barriers. These included: Conflict in staff and participants’ work schedules, a decline in interest and participation, adverse weather conditions, limited access to residences, and breaks in communications. On many occasions extra time and effort were spent in calling and rescheduling sessions for participants who were unable to keep their appointments. Further, assessment of these barriers were not explored. According to Lakhanpaul et al. (2014) there is a gap in research in exploring the underlying reported barriers in asthma care. There is a need for qualitative asthma research to explore these phenomena to assist future quality improvement community asthma management projects.
The success of the project is owed to the collaborative effort of the community members. Community-based participatory approaches (CBPA) provides opportunities between community members and practitioners through shared leadership, co-teaching, and co-learning (Brown et al., 2010; Kulbok, Thatcher, Park & Meszaros, 2012 & Tse, et al., 2015). With CBPA, leadership skills, cultural competence, interpersonal communication skills, flexibility, and patience were practiced in completing the DNP project.

**Interpretation of Findings**

The pre and posttest results on asthma knowledge revealed that the majority of participants increased their asthma knowledge after receiving asthma education and participating in the sessions at one month and at three months’ post-implementation. However, there were 21% (n=3) participants who believed that asthma medications can be addictive, made them breath faster, and inhaled steroids had the same effects as oral steroids. Such findings showed that there is a need to expand the asthma educational teaching to address asthma cultural beliefs and practices, and to include an additional class devoted to pharmacological treatments.

All participants reported in their posttest Asthma Education Knowledge Questionnaire (Appendix I) that asthma journaling was an important tool in managing asthma. However, only 50% (n=7) had asthma journal entries. This confirmed Farber’s (2005) research that knowledge alone does not change behaviors. It could be presumed that this age group did not enjoy writing. Writing or journaling is a somewhat academic exercise. It could also be presumed that many of the participants were away from formal schooling for too long, and may have not cultivated their writing skills for about 50 years or more.
Participants ACT pre and posttest results revealed that the KCAMP was effective in helping the participants control their asthma. There were 50% (n=7) of the participants who had uncontrolled asthma before KCAMP’s implementation, 79% (n=11) increased their ACT scores and had controlled asthma at one month, and 100% (n=14) of the participant had controlled asthma at three months. In Hawai’i, the average hospital cost for treating asthma per hospitalization was estimated at $13,755 which was costing Hawaii $14 million a year (Hawaii Asthma Initiative, 2013). None of the participants attending the KCAMP were hospitalized during the 3 months of the program, which may have saved the state of Hawai’i in hospital costs of over $192,570.

The MiniAQLQ pre and posttest results shown a significant improvement in the participants’ quality of lives with an increase in scores in the activity and emotional domains. These findings support the literature in that asthma education and self-management can decrease asthma, exacerbations, increase activity, and improve quality of life. However, in the symptoms domain, one participant had a decreased score due to having the flu during the three months’ post-implementation. This finding revealed that an influenza infection may be an asthma exacerbation as reported by Cates and Rowe (2013). There is a need to emphasize preventive measures in asthmatics such as taking the flu vaccines during cold and flu season.

The asthma skills knowledge pre and posttest showed that asthma education was the preferred strategy for managing asthma. The results also revealed that the participants’ best choices were different from their baselines taken at their one-month and three-months posttest survey. Of the participants, 14% (n=2) reported all of the interventions could be number one and
a combination of strategies were needed to control asthma successfully. These findings support the literature that the best intervention for controlling asthma is the combination of asthma education and self-management strategies.

Of the participants, 60% (n=9) used spacers with inhaled medications at the start of the KCAMP, none of the participants knew about peak flow meters. The participants were provided free peak flow meters and spacers at the beginning of implementation, which encouraged the participants to use these tools to manage their asthma. Results showed an increase in peak flow levels of their baseline measurements at their three-months post-implementation. However, 7% (n=1) decreased their peak flow levels during their one-month post-implementation due to the flu, which affected their ability to inhale and exhale. This finding was relative to the decreased MiniAQLQ scores in the symptoms domain and referred by authors Cates and Rowe (2013) that influenza infection can affect asthma.

FEV1 measures the air a person can exhale during a forced breath in one second and used to indicate disease progression (Glaab, Vogelmeier & Buhl, 2010; Melam, et al., 2014). The participants’ baseline and three-months post implementation FEV1 levels were compared and revealed that only 64% (n=9) increased their FEV1 levels. There is evidence that KCAMP interventions helped increased the participants’ ability to increase their FEV1 and perhaps slowed the progression of the disease. However, a small sample population and a short project implementation period warrants further exploration of this evidence in future studies.

Answers to interview questions showed that KCAMP was effective in decreasing asthma exacerbations, and the number of doctor’s office visits due to asthma. The program was also effective in preventing emergency room visits and hospitalizations due to asthma. This finding
supports the increase in asthma knowledge, MiniAQLQ, ACT, peak flow and FEV1 scores and levels.

Informal interviews revealed that participants used complementary alternative medicines (CAM), such as drinking hot water, hot tea and caffeinated drinks. Kealoha (2012) also reported these as common remedies in the Hawaiian community for native Hawaiian children with asthma. Participants’ reports that using spacers improved taste, and the ability to sing merits further research on the use of spacers to improve asthma management.

Evidence reported in the Asthma Education Knowledge Questionnaire (Appendix I), and recorded in journal entries showed that the participants gave importance to recognizing and eliminating asthma triggers. Testimonies included: “cleaned my house, my house is free of mold and dust”, “I avoided flowers and perfumes”, “I asked people not to smoke around me”, and “I did handwashing”.

Holding KCAMP as a group and one-on-one sessions demonstrated equally effective outcomes in delivering asthma education and asthma self-management training. Participants in the group setting and one-on-one visits equally increased their asthma knowledge, ACT, MiniAQLQ scores, and peak flow and FEV1 measurements.

The participants seen as group appeared to share a certain camaraderie in encouraging each other to practice their asthma management techniques, while participants seen in a one-on-one setting appeared more open in sharing their feelings and concerns because of the intimate and private nature of the visits. Home visits provided the opportunity to engage with the participants on a personal level and for more individualized care. It also presented the chance of observing the participants’ transformations in managing their asthma by implementing the
strategies they learned. Participants showed evidence that their behaviors changed and adopted learned asthma self-management strategies by removing carpeting and cleaning their homes. An assessment of safety issues and an evaluation of the participants’ home conditions and environment must be conducted and included in the program’s process prior to making one-on-one home visits.

Krieger, Song and Philby (2015) reported that home visitations by community health workers improved asthma self-management and quality of life for adults with asthma. KCAMP sessions delivered in home visits improved asthma knowledge, self-management and quality of life. Furthermore, the one-on-one sessions allowed the opportunity to focus on the needs of individual participants while fostering active participation of their family members. The presence of which provided added support and encouragement for the participants in learning more about asthma and adopting behaviors that contribute to better asthma self-management.

The participants that attended the group sessions showed active socialization where team work was observed, most especially seen when they were developing their personalized asthma action plans. There were rich verbal exchanges filled with laughter, and the sharing of asthma and personal experiences. Studies conducted by Watson et al. (2009) showed similar findings while providing asthma education for children in small groups. Watson et al. (2009) reported that asthma education taught in a small group of less than 10 participants improved clinical outcomes while learners actively interacted with each other.

Limitations

This DNP project had its limitations. The implications for practice change may have been restricted by a small sample size. Project results were not analyzed for statistical
significance, limiting the outcomes’ generalizability. Using convenience sampling for the project was advantageous, given the time constraints in which to complete this DNP project; the manpower available; budget constraints; and, the specific population recruited as participants. This sampling method allowed for rapid project organization; quick establishment of personal connection with the community; the immediate collection of data and sharing of results; and, the prompt formation of local opinion on whether the KCAMP was desired and needed for the community. Convenience sampling also made for more individualized teaching and greater control over the program sessions’ activities.

Having one session and a one-month implementation period for educating participants about asthma management, and demonstrating the use of peak flow meters and spacers may not have allowed for adequate time in fully engaging with the participants. Added training is also needed for follow-up and reinforcement of self-management training. More time could have also provided opportunities for additional measurements and data collection.

The participants’ Asthma Educational Knowledge Pre and Posttest and Asthma Skills Knowledge Pre and Posttests showed increased outcomes and revealed that knowledge in asthma and asthma education were the most helpful interventions. However, these assessment tools are untested, and may have affected the interpretation and reliability of the findings.

The participants’ incapacity for attending the KCAMP’s sessions was another limiting factor that may have affected the results of the project. The majority of the participants were able to attend the KCAMP group sessions; however, about a third were unable to do so. An alternative format, using a one-to-one approach, was created to accommodate individuals who could not make the scheduled sessions. However, the alternative format may have a differential
impact on the outcomes of those participating in the one-on-one sessions as these sessions had more time devoted to each individual. Participants in the one-on-one sessions had greater flexibility in scheduling and received their lessons at their convenience. These factors may have significantly affected their results.

**Implications and Recommendations**

This DNP project’s outcomes revealed that a community-centered asthma management program was effective in providing asthmatic Ka’u residents education on asthma, its management and interventions. This program is very much needed in the rural community setting of Ka’u. The KCAMP has been shown to improve asthma management among its participants.

The KCAMP project has generated interest, and plans are to offer the program to other rural Hawai‘i communities and a broader population. However, the program needs improvement and recommendations are detailed to increase its effectiveness. To gain greater impact and reliability of its outcomes, the project needs to recruit more individuals and establish a larger sample size. Having so will provide the opportunity to find statistically significant results which can be generalized and applied to a larger population.

Project time-constraints and participant scheduling prevented this DNP student from adding more sessions to the program. Additional classes can facilitate more time for participants to ask questions, review learned concepts, and for further reinforcement of asthma management strategies. Learning and changes in behavior take places more readily when learners are fully engaged, can actively participate in the learning process, and receive the content more than once (Bradshaw & Lowenstein, 2011). Future consideration is to provide more asthma education and
skills training that can possibly help fully engage the participants and have them invest more time in learning to manage their asthma.

Additional investigation is needed in determining the reliability and validity of the two untested assessments, the Asthma Educational Knowledge Pre and Posttests and Asthma Skills Knowledge Pre and Posttests. These tools can be reliable and validated by administering the assessments at two separate times for each individual and calculating the correlation between the two different measurements (Sullivan, 2011). Tests could be conducted in the future by administering the assessment tools to a different sample population on two separate occasions, and calculating the correlation of the measurements.

Complimentary alternative medications used in asthma may be further researched and included in the KCAMP. These medications could be incorporated in the asthma education sessions to further expand participant’s knowledge in the different therapies that are available and are effective in managing their asthma. Other alternative measurements for relieving asthma exacerbations could be further investigated.

The long term outcomes of the KCAMP were not measured, but may be done in the future by collecting data one-year post implementation including asthma costs. The KCAMP education sessions may be strengthened by measuring and providing strategies for treatment compliance. Steps for remembering how and when to take their peak flow measurements and use their spacers could be given during the sessions. Practical solutions can be taught that fit the participants’ individual schedules such as putting their peak flow meters and medications with spacers next to their toothbrushes, so that the participants would remember to take their peak flow levels as soon as they begin their morning. Another method could be placing their peak
flow meters and spacers next to their bedsides where they can take their measurements or medications immediately upon waking.

The project can be expanded and replicated in the future. Clinicians who specialize in community health services provide home visits to patients who have chronic diseases such as asthma in the rural areas to prevent exacerbations and complications. The development of a master curriculum would assist the project’s efforts in outreaching to additional clinicians by using a “train-the-trainer” model. Furthermore, this project demonstrates the cost effectiveness of the CBPA approach. A preliminary cost analysis, as previously discussed demonstrates the cost effectiveness of this type of CBPA approach to asthma management.

Implications related to sustaining this project include training additional staff and volunteers from the community to provide asthma education and skills management training; work performed at the executive level so asthma management can be adopted and embedded into a healthcare agency’s strategic plans; and, mobilization efforts of asthma management by actively promoting awareness through collaboration with other health groups, using the media and presenting the results of this project to other healthcare organizations.

Healthy People 2020’s (2016) goal is to promote respiratory health through better prevention, detection, treatment and education efforts. KCAMP has the potential for being integrated into policy and incorporated into other community health care programs. This program promotes asthma exacerbation prevention, helps improve treatments and supports education. It is the hope that community asthma education management programs will be recognized by health care insurances and the reimbursement of services can be secured.
Implications and Recommendations Based on the DNP Essentials

The eight DNP essentials (Appendix Q) were accomplished in the development, implementation and evaluation of this DNP Project. These essentials are the foundational competencies for advanced nurses when graduating from any DNP program (American Association of College of Nursing, 2006).

**Essential I: Scientific Underpinnings for Practice**

The DNP project developed is an approach based on scientific evidence to transform asthma healthcare delivery and improve health outcomes for diverse patient populations including those who are of Hawaiian ancestry, and are vulnerable or live in the rural areas of Hawai‘i. Theoretical ACE Star Model and community participatory scientific approaches were used to design, implement and evaluate the project. The project’s results can serve as a model for other communities to promote asthma education and asthma self-management.

**Essential II: Organizational and Systems Leadership for Quality Improvements and Economics**

The DNP project was an opportunity for this DNP student to develop skills and expertise in assessing organizations, identifying systems’ issues, and the facilitation of organization-wide changes. Leadership, management, communication and collaboration skills were successfully developed to ensure the delivery of asthma community education and asthma self-management training. The principles of marketing, finance, and economics were used to promote, gain collaboration and participation, and secure volunteers and donors for the DNP project. This DNP student demonstrated sensitivity to the diversity of organizational cultures and populations.
including participants and providers by managing the ethical dilemmas, protecting participants’ rights and privacy, providing autonomy, and respecting cultural and ethnic asthma practices.

The economic implications of KCAMP is determined by examining the potential cost-savings to the state of Hawai‘i. The cost of ambulance service is over $1,000 (Hawai‘i State Department of Health and the Emergency Services Department, 2013). The average in-network cost of an emergency room visit is over $2,000, and depending on severity can reach $20,000 or more (Abrams, 2013). The average hospital costs due to asthma were estimated at $13,755 per hospitalization which costs the state approximately $14 million a year (Hawaii Asthma Initiative, 2013). The KCAMP saved a total cost of over $28,000 a month for the 14 participants, and over $14,000 per month in asthma emergency services. During the program none of the participants were hospitalized which demonstrated that the state would save over $68,775. Based on the performance of the 14 participants, the KCAMP has shown there is a potential savings of over $192,570 per year in medical costs for the state of Hawai‘i.

**Essential III. Evidence-Based Practice/Translation Science**

In creating this DNP project, this student developed strategies to analyze evidence-based literature and employ this into practice. The project processes were designed and implemented to evaluate outcome practices with the intent to disseminate findings for improving healthcare outcomes. The evaluation of the implementation of the KCAMP evidence-based quality improvement project was conducted by addressing patterns, variances in outcomes and evidences that the project promoted safe, efficient, effective, and equitable, community and patient-centered asthma care. The programs’ results revealed recommendations for new asthma community practices.
**Essential IV: Information Systems/Technology**

The DNP project is an application of informatics as the project used databases for literature research, and utilized computers and computer applications in designing and implementing the project lessons and activities. The use of Inspirometry Instruments and peak flow meters, employment of computer applications to collect data, accessing the repository of data to perform data analysis demonstrated medical informatics is valuable. In addition, essential, appropriate, and accurate data collection activities involved nursing informatics to generate evidence. The presentation of the project, proposal defense and final defense incorporates informatics to disseminate the project’s information. Access of publications of professional nursing journals and various agency websites are further examples of using healthcare information systems and patient care technology while honoring the ethical and legal protections related to personal health information and health communications. The KCAMP’s delivery methods must be commensurate with the level of audience; thus, technology will need to be incorporated into the program when it is expanded for youths. Computer applications and asthma peak flow measurement telemonitoring can also be developed for the program.

**Essential V: Health Care Policy and Ethics**

The DNP project provided the opportunity to critically analyze asthma health policies and Asthma Hawai’i Initiative and related issues from the perspective of consumers, nursing, other health professions and stakeholders in policy and public forums. In addition, the project encouraged this DNP student to actively advocate for the nursing profession within the local healthcare communities. Promoting asthma care awareness provided the DNP student the opportunity to gain comfort in speaking publicly and privately with community leaders about
asthma healthcare issues. Leadership skills were vital to this essential, as well. As a leader through this DNP project, the art and science of influencing a group toward the achievement of a goal was exercised and further developed. This DNP student had the privilege of serving on numerous committees at various levels of involvement such as: Director of Ka’u Community Rural Health Association; Hawai’i National League of Nursing Ambassador; Academic Progression in Nursing (APIN) Member; and, volunteer educator for the American Lung Association Open Airways and Asthma 101 classes. Leadership skills were also employed in the implementation of this DNP project as an active member of the Hawai’i Community College (HawCC) Nursing Curriculum Committee, HawCC College Educational Policy Committee, HawCC Academic Advising, Admission and Progression and HawCC Student Recognition Committee.

**Essential VI: Inter-professional Collaboration**

Through the KCAMP project, this DNP student employed collaborative and consultative leadership skills, using effective verbal and written communication skills. The project provided opportunities to cooperate with community leaders and members on an inter-professional level to improve patient outcomes. The development of effective communication skills benefited this DNP student as a practitioner to continue the work of interprofessional teams in the care of asthma patients.

**Essential VII: Prevention and Population Health**

The KCAMP project facilitated opportunities to collaborate with the healthcare team, various healthcare organizations and community members to ensure the delivery of evidence-based, culturally sensitive community prevention and population health services for individuals,
aggregates and populations based on the analysis of bio-statistical and environmental data. The provisions of the project used concepts related to community. Environmental factors such as Kīlauea volcano’s constant emission of sulfuric acid and vog were considered. The culture and concerns or limitations of rural Ka’u were taken into account in creating and implementing the project.

*Essential VIII: Advanced Nursing Practice and Education*

By utilizing this essential, the project allowed this DNP student to deliver comprehensive evidence-based asthma nursing education and care as well as promote the health and prevention of disease exacerbations within a community setting. According to Johnson (2010), “The privilege of being a healthcare provider comes with the responsibility and societal obligation to provide healthcare to everyone, regardless of the ability to pay” (p.45).

The DNP project facilitated responsibility and demonstrated societal obligation using advanced levels of clinical judgement, and teaching and learning strategies. It was also important to acquire an understanding of health systems and healthcare policy, and adapt these to meet the needs of a diverse clientele to improve asthma patient outcomes.

*Role as an educator.* This DNP student utilized advanced skills and knowledge in an identified area of nursing practice with translation of science into practice to prepare individuals for interdisciplinary practice and patient-centered care. One of the abilities developed was the skill of designing asthma educational materials for patients and community education that was simple to read and which could be understood by community members regardless of age, gender, economic, educational and professional backgrounds or differences.
Role as a preceptor/mentor. Improving clinical outcomes through investment of time, energy, and personal knowledge can enable the growth and development of another. Through this aspect, the DNP project enabled this DNP student to mentor or precept organizational leaders, community members, and participants and their family members. It is the hope that mentoring them will increase asthma awareness, where other can also be mentored.

Plans for Dissemination

The results of the project and this final paper will be submitted to the University of Hawai`i’s graduate division in March 2016. The final defense was on March 14, 2016. The results of the project will be shared with the participants, Hui Mālama Ola Nā ʻŌiwi, ALAH, and the Kaʻu community. Plans are in place to reach a larger population of asthmatics and other communities through an established and continued partnership with Hui Mālama Ola Nā ʻŌiwi and the ALAH. The KCAMP is scheduled to hold a pilot summer program for children in July 2016. This program was inspired by one of the granddaughters of a participant. Plans for project dissemination also include presentations at conferences, meetings and through a pending publication in a peer-reviewed journal.

Future Expansion

The KCAMP project will be expanded to include additional educational sessions to encompass cultural practices in asthma, alternative practices, and pharmacological knowledge. There are also plans to provide the KCAMP to other rural areas in Hawai`i such as Pahoa, Kona, Waimea, and Honoka`a districts.
Summary

Guided by the ACE Star model, the combination of asthma community education and the development of self-management asthma skills such as identifying and eliminating asthma triggers, applying an asthma action plan, using peak flow meters and spacers benefited the participants of this EBP, DNP project. Evidence showed that the program increased the participants’ knowledge in asthma, decreased asthma exacerbations, prevented hospitalizations due to asthma, provided participants confidence to manage their asthma, increased their quality of life and changes in asthma behaviors. Through the participants’ oral accounts, interview and journal reports, participants tested an increased understanding of their asthma condition, felt in control of their symptoms and showed increased management skill of their asthma as evidence by the ACT, MiniAQLQ, FEV1 and peak flow scores and measurements.

This DNP project was successfully implemented through the hard work and collaboration of the Hui Mālama Ola Nā ‘Ōiwi Malama staff and key personnel, and the participation of community members of volunteers. Of equal importance were the guidance and collaboration of outside advisors, a pharmacy doctor, the asthma guest speakers, and doctoral advisors, and the KCAMP participants whose vital involvement contributed to the project success.

Collaborating with Hui Mālama Ola Nā ‘Ōiwi proved to be the key factor in making this EBP, DNP project logistically and economically feasible. Future plans to expand and adopt the KCAMP into existing community based programs in Hawai‘i county, state and federal funding will need to be sought and secured. A continued partnership with Hui Mālama Ola Nā ‘Ōiwi and other community stakeholders will also sustain the project.
Asthma among adults is a serious but manageable chronic lung condition. Adults who have asthma need community involvement through asthma education and self-management skills training to achieve normal breathing and to experience a better quality of life. Adopting KCAMP can actively engage community members, and enhance asthma self-management and treatment for the best clinical outcomes.
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APPENDIX A

Asthma Control Test (ACT) Pre 1Month 3Months
Knowledge Pre and Post Educational Tool

Participant’s Code Number: _______________ Today’s Date: ______________________

Asthma Control Test

Patients: 1. Answer each question and write the answer number in the box to the right of each question.
2. Add your answers and write your total score in the TOTAL box shown below.
3. Discuss your results with your doctor and staff.

1. In the past 4 weeks, how much of the time did your asthma keep you from getting as much done at work, school or at home?

<table>
<thead>
<tr>
<th>All the time</th>
<th>Most of the time</th>
<th>Some of the time</th>
<th>A little of the time</th>
<th>None of the time</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

2. During the past 4 weeks, how often have you had shortness of breath?

<table>
<thead>
<tr>
<th>More than once a day</th>
<th>Once a day</th>
<th>3 to 6 times a week</th>
<th>Once or twice a week</th>
<th>Not at all</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

3. During the past 4 weeks, how often did our asthma symptoms (wheezing, coughing, and shortness of breath, chest tightness or pain) wake you up at night or earlier than usual in the morning?

<table>
<thead>
<tr>
<th>4 or more nights a week</th>
<th>1 or 2 times per day</th>
<th>2 or 3 times per week</th>
<th>Once a week or less</th>
<th>Not at all</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

4. During the past 4 weeks, how often have you used your rescue inhaler or nebulizer medication (such as albuterol)?

<table>
<thead>
<tr>
<th>3 or more nights a week</th>
<th>1 or 2 times per day</th>
<th>2 or 3 times per week</th>
<th>Once a week or less</th>
<th>Not at all</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

5. How would you rate your asthma control during the past 4 weeks?

<table>
<thead>
<tr>
<th>Not controlled at all</th>
<th>Poorly controlled</th>
<th>Somewhat controlled</th>
<th>Well Controlled</th>
<th>Completely controlled</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL

If your score is 19 or less, your asthma may not be under control. Be sure to talk with your doctor about your results.
APPENDIX B

Press Release

The Ka’u Community Asthma Management Program

The Ka’u Community Asthma Management Program (KCAMP) is a collaborative project between the University of Hawai‘i at Mānoa’s (UHM) Doctor in Nursing Practice Program, Ka’u Rural Health Community Association, Inc. (KRHCAI) and Hui Mālama Ola Nā ‘Ōiwi. Luzviminda Banez Miguel, MSNed, RN a Doctor in Nursing Practice student at UHM will be conducting the project and is leading the program for people who has asthma that live in the Ka’u community. The program will be launched this year with KRHCAI and Hui Mālama Ola Nā ‘Ōiwi.

Asthma is a serious health condition that affects many individuals in Ka’u. It is a disease that is characterized by recurrent attacks of breathlessness and wheezing which vary in severity and frequency from person to person. The negative effects of asthma on its sufferer’s not only distress the well-being of the individuals, but affect socio-economic factors. Asthmatic adults often experience increase in health care costs, lost in productivity, reduction of participation in daily activities, and decreased quality of life.

Understanding asthma and improvement of its management is needed. The Ka’u Community Asthma Management Program (KCAMP) is an important project that will provide the skills needed to improve asthma management and the quality of lives of asthmatic adults in Ka’u that suffer from poorly controlled asthma. This project will also help improve the community’s current awareness of asthma, and help decrease the prevalence of the disease while providing information for other community health care providers.

For more information, email: miguellb@hawaii.edu

Contact

Luzviminda Banez Miguel, MSNed, RN
University of Hawai‘i at Mānoa DNP Student
Ka’u Rural Health Community Association Inc. Director
Email: miguellb@hawaii.edu

Printed in KRHCAI Website August 2015 and in Ka’u Calendar Newspaper
APPENDIX C
KCAMP Flyers

Are you suffering from Asthma?

If the answer is YES

The University of Hawai‘i at Mānoa is conducting an asthma need assessment:

Luzviminda Miguel, RN and Doctor in Nursing Practice student, would like to invite you to fill a Demographic Survey and an Asthma Control Test (ACT) Survey

The purpose of this survey is to learn what interventions or asthma practices you would like to know. Your participation will help nurses, doctors and others to create a tool to help you manage your asthma.

To learn more about the project, please call Luzviminda Miguel, RN, MSNEd, at 808-223-5087 or email me at miguellb@hawaii.edu
APPENDIX D

Banner

Luzviminda B. Miguel, RN, MSNed

University of Hawai‘i at Manoa
Doctor in Nursing Practice Program

Ka‘u Community Asthma Management Program

“Breathe Easy Ka‘u”

Hui Mālama Ola Na ʻŌiwi
APPENDIX E

Information About the KCAMP Project

Luzviminda B. Miguel, RN, MSNed
University of Hawai‘i at Mānoa
Doctor in Nursing Practice Program

About the Ka‘u Community Asthma Management Program

**Purpose of the management program**
Asthma is a serious health condition that affects many people throughout the world. The disease is characterized by recurrent attacks of breathlessness and wheezing which vary in severity and frequency from person to person. Asthma has negative effects on its sufferers causing increases in health care costs, lost productivity, reduced participation in activities, and decreased quality of life. The reason we are doing this program is to provide a community-based asthma education and asthma self-management training for adults ages 18 and above with asthma in the Ka‘u District to improve asthma self-management and to reduce asthma exacerbation, number of office visits and number of emergency room visits as compared to current practice without community-based asthma education and asthma self-management training.

**Type of Asthma Intervention**
This program will involve educational sessions learning about asthma, how to manage asthma symptoms, use of peak flow meter and spacers, measuring lung capacity, and making an asthma action plan. These interventions have been used worldwide to help people with asthma manage their asthma symptoms and disease.

**Participant selection**
We are inviting all adults ages 18 and above with asthma in the Ka‘u District who can read and write English, and without a cardio-pulmonary obstructive disease (COPD) or and diagnosed with mental illness.

**Description of the Process**
*During the program you make five visits to the center.*

- *In the first visit, you will have an orientation, answer questions about your health, and your weight and forced expiratory volume capacity (measurement of exhalation) will be measured.*
- *At the next visit, which will be one week later, you will again be asked some questions about your health and then you will be given an asthma educational class and create your own asthma action plan.*
- *After one week, you will come back to the center/clinic and you will learn to use peak flow meter, spacer, and create an asthma journal.*
- *After one month, you will come back to the center and answer questions about your health, and we will measure your forced expiratory volume (measurement of exhalation).*
• After the third month, you will come back to the center and answer questions about your health, and forced expiratory lung capacity (measurement of exhalation) will be measured. You will also submit an asthma journal.

Duration
The program takes place over 5 sessions in 3 months total. During that time, it will be necessary for you to come to the clinic/hospital/health facility 2 to 4 hours each session. We would like to meet with you one month after you receive the program and three months for a final check-up.

In total, you will be asked to come 5 times to the clinic in 5 months. At the end of 5 months, the program will be finished.

Benefits
If you participate in this program, you will have the following benefits: asthma education at no charge to you, receive free peak flow meter, spacers and resources to help you manage your asthma.

Confidentiality
With this program, something out of the ordinary is being done in your community. It is possible that if others in the community are aware that you are participating, they may ask you questions. We will not be sharing the identity of those participating in the program.

The information that we collect from this program will be kept confidential. Information about you that will be collected during the program will be put away and no-one but the primary investigator will be able to see it. Any information about you will have a number on it instead of your name. Only the primary investigator and assistance will know what your number is and we will lock that information up with a lock and key. It will not be shared with or given to anyone except for the University of Hawai`i Mānoa Doctor in Nursing Program internal advisors for the principal investigators.

Sharing the Results
The knowledge that we get from doing this program will be shared with you before it is made widely available to the public. Confidential information will not be shared. There will be small meetings in the community and these will be announced. After these meetings, there will be a possibility that we will publish the results in order that other interested people may learn from our program.

Who to Contact
If you have any questions you may ask them now or later, even after the program has started. If you wish to ask questions later, you may contact me in any of the following: miguellb@hawaii.edu
APPENDIX F
Demographics Survey

Luzviminda B. Miguel, RN, MSNed
University of Hawai‘i at Mānoa
Doctor in Nursing Practice Program (KCAMP Project)

Participant’s Code Number: _______________  Today’s Date: ____________________

1. **Do you have asthma?** □ Yes □ No  If no please answer the following questions based on family member or relative with asthma (List relation) __________

2. **Age of person with Asthma:** ________

3. **Sex of Person with Asthma:** □ Female □ Male

4. **Where does this person live?**

   □ Hilo □ Puna □ Volcano □ Pahala □ Na‘ālehu □ OceanView □ Kona
   □ Other __________

5. **Ethnicity of Asthmatic:** □ Hawaiian □ Caucasian □ Black or African American □ Asian (List) ________ □ Polynesian or Pacific Islander (List) ________ □ American Indian or Eskimo □ Hispanic or Latino □ Other (List) ________

6. **Highest Grade or Years of school completed**

   □ High school □ 2 years of College □ 4 years of College
   □ Graduate □ Post-Graduate □ Other __________

7. **Occupation** □ Clerical □ Business □ Healthcare □ Other __________

8. **Do you think your asthma is** □ well-controlled □ somewhat controlled □ poorly controlled

9. **Do you want to know more about asthma management?** □ Yes □ No

10. **What do you want to know?** □ Medications □ Treatments □ Use of spacer

   □ Peak flow meter □ Inspirometry □ Alternatives
   □ other Specify: ________________________________

11. **Any Comments? Please list other information on what you would like to know about asthma** (on back of form).
APPENDIX G

Ka’u Asthma Management Program Attendance Sheet

DATE: ______________________

(set up): Time___________

Start: ________________

No. Of Participants______________

<table>
<thead>
<tr>
<th>Names</th>
<th>Code Assigned</th>
<th>Showed Up</th>
<th>Not in Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>
APPENDIX H

Mini Asthma Quality of Life Questionnaire (MiniAQLQ)

MINI ASTHMA QUALITY OF LIFE QUESTIONNAIRE SELF-ADMINISTERED

<table>
<thead>
<tr>
<th>KCAMP PARTICIPANT’S CODE NUMBER: _______________ DATE: ______________</th>
</tr>
</thead>
</table>

Please complete all questions by circling the number that best describes how you have been during the last 2 weeks as a result of your asthma.

IN GENERAL, HOW MUCH OF THE TIME DURING THE LAST 2 WEEKS DID YOU:

<table>
<thead>
<tr>
<th>All of the Time</th>
<th>Most of the Time</th>
<th>A Good Bit of the Time</th>
<th>Some of the Time</th>
<th>A Little of the Time</th>
<th>Hardly Any of the Time</th>
<th>None of the Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Feel SHORT OF BREATH as a result of your asthma?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2. Feel bothered by or have to avoid DUST in the environment?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3. Feel FRUSTRATED as a result of your asthma?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4. Feel bothered by COUGHING?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5. Feel AFRAID OF NOT HAVING YOUR ASTHMA MEDICATION AVAILABLE?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Question</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>6. Experience a feeling of CHEST TIGHTNESS or CHEST HEAVINESS?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Feel bothered by or have to avoid CIGARETTE SMOKE in the environment?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Have DIFFICULTY GETTING A GOOD NIGHT’S SLEEP as a result of your asthma?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Feel CONCERNED ABOUT HAVING ASTHMA?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**IN GENERAL, HOW MUCH OF THE TIME DURING THE LAST 2 WEEKS DID YOU:**

<table>
<thead>
<tr>
<th>Question</th>
<th>All of the Time</th>
<th>Most of the Time</th>
<th>A Good Bit of the Time</th>
<th>Some of the Time</th>
<th>A Little of the Time</th>
<th>Hardly Any of the Time</th>
<th>None of the Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Experience a WHEEZE in your chest?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>11. Feel bothered by or have to avoid going outside because of WEATHER OR AIR POLLUTION?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>
HOW LIMITED HAVE YOU BEEN DURING THE LAST 2 WEEKS DOING THESE ACTIVITIES AS A RESULT OF YOUR ASTHMA?

<table>
<thead>
<tr>
<th>Activity Type</th>
<th>All of the Time</th>
<th>Most of the Time</th>
<th>A Good Bit of the Time</th>
<th>Some of the Time</th>
<th>A Little of the Time</th>
<th>Hardly Any of the Time</th>
<th>None of the Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. STRENOUS ACTIVITIES (such as hurrying, exercising, running upstairs, sports)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>13. MODERATE ACTIVITIES (such as walking, housework, gardening, shopping, climbing stairs)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>14. SOCIAL ACTIVITIES (such as talking, playing with pets/children, visiting friends/relatives)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>15. WORK-RELATED ACTIVITIES (tasks you have to do at work*)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

*If you are not employed or self-employed, these should be tasks you have to do most days.

<table>
<thead>
<tr>
<th>Domain Code:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms: 1, 4, 6, 8, 10</td>
</tr>
<tr>
<td>Activity Limitation: 12, 13, 14, 15</td>
</tr>
<tr>
<td>Emotional Function: 3, 5, 9</td>
</tr>
<tr>
<td>Environmental Stimuli: 2, 7, 11</td>
</tr>
</tbody>
</table>
APPENDIX I

Asthma Interview Questionnaire

Interview Questions: Pre☐ 1Month ☐ 3Months ☐

Participant’s Code Number: _______________ Today’s Date: ____________________

How many ER, office visits you had related to asthma since the last time we saw you?

How many asthma attacks you had since the last time we saw you?

What are your peak flow measurements?

Did you use your peak flow meter?
If you yes:

How often? Day? Week?

What are your feelings?

How is your asthma?

Other?
APPENDIX J

Asthma Educational Session Knowledge Pre and Posttest
Pre □ and Posttest □ 1 Months □ 3 Months Posttest
(Most Questions are adopted from American Lung Association Asthma 101)
Participants Code Number: __________________ Date: ________________

Please circle your answers for either TRUE OR FALSE
1. Asthma action plan is useful………………………………………… TRUE FALSE
2. Asthma peak flow is useful……………………………………... TRUE FALSE
3. Asthma journaling is useful …………………………….TRUE FALSE
4. Knowing about asthma is important………………………………….. TRUE FALSE
5. Knowing signs and symptoms of asthma is important………… TRUE FALSE
6. There is no cure for asthma………………………………………….. TRUE FALSE
7. Although asthma causes breathing problems, asthma episodes are not dangerous…

…………………………………………………………………………………….. TRUE FALSE
8. Inhaled steroids have the same effects as steroids taken by mouth……TRUE FALSE
9. Very little can be done to reduce environmental triggers of asthma…… TRUE FALSE
10. Asthma medications are not addictive………………………….. TRUE FALSE
11. People with asthma should not participate in sports……………… TRUE FALSE
12. Asthma episodes always occur suddenly, without warning………… TRUE FALSE
13. Asthma can be caused by emotional stress or other psychological
   problems………………………………………………………………………… TRUE FALSE
14. Rescue or reliever medication (albuterol) helps during an asthma episode by making you
   breath faster………………………………………………………………….. TRUE FALSE
15. The Ka’u Community Asthma Management Program is helpful in understanding more
   about asthma management…………………………………………… TRUE FALSE
APPENDIX K
ASTHMA 101 BOOKLET PICTURE
APPENDIX L
Asthma Skills Knowledge Pre and Posttest

The Ka’u Community Asthma Management Program

Pre ☐ or Posttest ☐ 1 month ☐ 3 months ☐

Asthma Skills Knowledge

Participant’s Code Number: _______________ Today’s Date: ____________________

What do you use to manage your asthma? (Check your answer/s).

Inhaler_________
Spacer_________
Peak Flow Meter_________
Recognizing My Triggers_________
Stress Management_________
Medications______________
List Other Methods: _______________________________

Which is the most helpful in managing your asthma?

Put a number beside these interventions from 1(most), 2(second best), 3 (third best), 4 (fourth) to 5 (Least). Number 1 being the best in helping you manage your asthma.

Educational Asthma Classes _____________
Using Peak Flow Meter _________________
Verbalization_________________________
Making Asthma Action Plan _____________
Spacers ______________________________
APPENDIX M
Asthma Action Plan

Asthma Action Plan For: ___________________       Date: ____________________
Doctor’s Name: Phone: ________________________

GREEN ZONE.

Peak flow# You’re doing well. You have no symptoms of asthma and can do usual activities. Take the following medicines every day to keep asthma under good control.
1. 
2. 
3.

YELLOW ZONE.

Also use the yellow zone for cold and flu symptoms

Peak flow# Slow down. Something has caused your asthma to flare up. You may be coughing, wheezing, chest hurts or you feel short of breath. You may also notice that you feel more tired than normal, moody, waking at night due to cough, allergy symptoms and unable to do usual activities. Avoid asthma triggers. Follow the treatment below.
First:
1. 
2. 
No improvement? Follow the next step. If your peak flow # is in yellow zone and asthma symptoms do not change take the following:
1. 
2. 
Continue for the next ___ hours. Next call your doctor today for further instructions.
If your asthma symptoms are worse or peak flow # is going down after treatment, follow red zone instructions.

RED ZONE

Peak flow# below. This is a medical alert! You may feel very short of breath, symptoms from yellow zone are getting worse. Follow the treatment below:
1. 
2. 
3. 
Go to the emergency room if: 1. Peak flow # is still in the red zone and asthma symptoms are not improving after treatment with Albuterol/Proventil/Xopenex.
2. You cannot reach your doctor. Call 911 if you cannot walk or talk due to shortness of breath, lips or fingernails are blue.
APPENDIX N
Asthma Journal Questionnaire

Date: _______________

1. Did you experience any of the following asthma symptoms today? (Circle all that apply)
   - Wheezing
   - Shortness of breath
   - Tightness in chest
   - Cough

   If yes, what do you think may have triggered your symptoms?

2. Did you miss or avoid any activities today due to asthma symptoms? Circle your answer
   - Yes
   - No

3. How did you sleep last night? (Circle your answer)
   - No waking
   - No wheezing or coughing
   - Slept well; slight wheeze or cough
   - Awake 2-3 times; wheeze or cough
   - Bad night; awake most of the time

4. Did you take your daily preventative medications (other than your quick-relief inhaler) today?
   Circle your answer.  
   - Yes
   - No

   If not, was it because you (Circle your answer)
   - Were too busy
   - Felt fine
   - Were out of medication
   - Simply forgot

   Other – List why: _______________________

5. Did you use your quick-relief inhaler today? (Circle your answer)
   - Yes
   - No

   If yes, how many puffs and how often? _____________________________

6. Did you have an asthma attack today? (Circle your answer)
   - Yes
   - No

7. My peak flow today was______________________ when I checked at AM/PM.

8. Other Comments you want to share: _______________________________
APPENDIX O

KCAMP Certificate of Appreciation

PRESENTED TO:

Participant’s Name

In recognition of the valuable support and participation for the University of Hawai’i at Mānoa School of Nursing & Dental Hygiene Doctor In Nursing Program, Hui Mālama Ola Nā ʻŌiwi and the Ka’u Community Asthma Management Program (KCAMP) held at Na’alehu on August 2015 to December 2015.

__________________
Luzviminda Banez Miguel, RN, MSNed
UHM DNP Student

__________________
Keamalu Waltzen
Hui Mālama Ola Nā ʻŌiwi Staff and Coordinator
Naʻālehu, Hawaii

__________________
Lono Grace
Hui Mālama Ola Nā ʻŌiwi Volunteer and KCAMP Manager

“Breathe Easy Ka’u”
APPENDIX P
KCAMP LOGIC MODEL

Situation: The Ka’u District, which has the highest number of people with asthma on Hawai’i Island, does not have an existing asthma management program. The lack of a program which supports and educates people about asthma in Ka’u contributes to poor asthma management. Therefore, the goals of this project is to reduce asthma exacerbations and improve healthcare outcomes using evidence-based practices of a community asthma management program.

<table>
<thead>
<tr>
<th><strong>Inputs</strong></th>
<th><strong>Activities</strong></th>
<th><strong>Outputs</strong></th>
<th><strong>Participation</strong></th>
<th><strong>Outcomes</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time:</strong> 5 months</td>
<td></td>
<td>Increase asthma awareness and knowledge; Learn to incorporate and developed skills of asthma journaling or diary writing; Use peak flow meter and spacer; Change asthma attitudes; Advocating for others asthmatics; Develop motivation for the self-managing asthma.</td>
<td>Change behaviors; Learn and adopt asthma practices; Possess a change in decision making for managing their asthma. Recognition of KCAMP by practitioners; Improved practices for asthma management in Ka’u; Adoption of KCAMP guidelines by physicians and other organizations for teaching their patients in managing asthma; Decrease in emergency room visits, use of medications, asthma exacerbations and symptoms.</td>
<td>Change in environment Transformation of social conditions; Improvement of economic conditions; Decrease of medical costs; Improvement of political conditions; Changes in the health of the community by decreasing its asthma disparity.</td>
</tr>
<tr>
<td><strong>Money:</strong> donations</td>
<td>Design &amp; Provide Community-based asthma education to staff.</td>
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<td></td>
</tr>
<tr>
<td><strong>Partners:</strong> KRHACI, ALA, Hui Mālama Ola Nā ‘Ōiwi, community members.</td>
<td>Recruit Participants</td>
<td></td>
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</tr>
<tr>
<td><strong>Equipment</strong> peak flow meters, spirometry instrument, spacers, computer, scale, tape measure</td>
<td>Implement community asthma education and self-management strategies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Facility:</strong> Hui Mālama Ola Nā ‘Ōiwi, Naalehu Park</td>
<td>Data Collection &amp; Evaluation</td>
<td>Community Volunteers/Staff &amp; Participants</td>
<td></td>
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</tbody>
</table>

KCAMP Logic Model
APPENDIX Q
The Essentials of Doctoral Education for Advanced Nursing Practice

I. Scientific Underpinnings for Practice

The DNP program prepares the graduate to:
1. Integrate nursing science with knowledge from ethics, the biophysical, psychosocial, analytical, and organizational sciences as the basis for the highest level of nursing practice.
2. Use science-based theories and concepts to:
   • determine the nature and significance of health and health care delivery phenomena;
   • describe the actions and advanced strategies to enhance, alleviate, and ameliorate health and health care delivery phenomena as appropriate; and
   • evaluate outcomes.
3. Develop and evaluate new practice approaches based on nursing theories and theories from other disciplines.

II. Organizational and Systems Leadership for Quality Improvement and Systems Thinking

1. Develop and evaluate care delivery approaches that meet current and future needs of patient populations based on scientific findings in nursing and other clinical sciences, as well as organizational, political, and economic sciences.
2. Ensure accountability for quality of health care and patient safety for populations with whom they work.
   a. Use advanced communication skills/processes to lead quality improvement and patient safety initiatives in health care systems.
   b. Employ principles of business, finance, economics, and health policy to develop and implement effective plans for practice-level and/or system-wide practice initiatives that will improve the quality of care delivery.
   c. Develop and/or monitor budgets for practice initiatives.
   d. Analyze the cost-effectiveness of practice initiatives accounting for risk and improvement of health care outcomes.
   e. Demonstrate sensitivity to diverse organizational cultures and populations, including patients and providers.
3. Develop and/or evaluate effective strategies for managing the ethical dilemmas inherent in patient care, the health care organization, and research.

III. Clinical Scholarship and Analytical Methods for Evidence-Based Practice

1. Use analytic methods to critically appraise existing literature and other evidence to determine and implement the best evidence for practice.
2. Design and implement processes to evaluate outcomes of practice, practice
patterns, and systems of care within a practice setting, health care organization, or community against national benchmarks to determine variances in practice outcomes and population trends.

3. Design, direct, and evaluate quality improvement methodologies to promote safe, timely, effective, efficient, equitable, and patient-centered care.

4. Apply relevant findings to develop practice guidelines and improve practice and the practice environment.

5. Use information technology and research methods appropriately to:
   - collect appropriate and accurate data to generate evidence for nursing practice
   - inform and guide the design of databases that generate meaningful evidence for nursing practice
   - analyze data from practice
   - design evidence-based interventions
   - predict and analyze outcomes
   - examine patterns of behavior and outcomes
   - identify gaps in evidence for practice

6. Function as a practice specialist/consultant in collaborative knowledge-generating research.

7. Disseminate findings from evidence-based practice and research to improve healthcare outcomes

IV. Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care

1. Design, select, use, and evaluate programs that evaluate and monitor outcomes of care, care systems, and quality improvement including consumer use of health care information systems.

2. Analyze and communicate critical elements necessary to the selection, use and evaluation of health care information systems and patient care technology.

3. Demonstrate the conceptual ability and technical skills to develop and execute an evaluation plan involving data extraction from practice information systems and databases.

4. Provide leadership in the evaluation and resolution of ethical and legal issues within healthcare systems relating to the use of information, information technology, communication networks, and patient care technology.

5. Evaluate consumer health information sources for accuracy, timeliness, and appropriateness.

V. Health Care Policy for Advocacy in Health Care

1. Critically analyze health policy proposals, health policies, and related issues from the perspective of consumers, nursing, other health professions, and other stakeholders in policy and public forums.

2. Demonstrate leadership in the development and implementation of institutional,
local, state, federal, and/or international health policy.

3. Influence policy makers through active participation on committees, boards, or task forces at the institutional, local, state, regional, national, and/or international levels to improve health care delivery and outcomes.

4. Educate others, including policy makers at all levels, regarding nursing, health policy, and patient care outcomes.

5. Advocate for the nursing profession within the policy and healthcare communities.

6. Develop, evaluate, and provide leadership for health care policy that shapes health care financing, regulation, and delivery.

7. Advocate for social justice, equity, and ethical policies within all healthcare arenas.

VI. Interprofessional Collaboration for Improving Patient and Population Health

Outcomes

1. Employ effective communication and collaborative skills in the development and implementation of practice models, peer review, practice guidelines, health policy, standards of care, and/or other scholarly products.

2. Lead interprofessional teams in the analysis of complex practice and organizational issues.

3. Employ consultative and leadership skills with intraprofessional and interprofessional teams to create change in health care and complex healthcare delivery systems.

VII. Clinical Prevention and Population Health for Improving the Nation’s Health

1. Analyze epidemiological, biostatistical, environmental, and other appropriate scientific data related to individual, aggregate, and population health.

2. Synthesize concepts, including psychosocial dimensions and cultural diversity, related to clinical prevention and population health in developing, implementing, and evaluating interventions to address health promotion/disease prevention efforts, improve health status/access patterns, and/or address gaps in care of individuals, aggregates, or populations.

3. Evaluate care delivery models and/or strategies using concepts related to community, environmental and occupational health, and cultural and socioeconomic dimensions of health.

VIII. Advanced Nursing Practice

1. Conduct a comprehensive and systematic assessment of health and illness parameters in complex situations, incorporating diverse and culturally sensitive approaches.

2. Design, implement, and evaluate therapeutic interventions based on nursing science and other sciences.
3. Develop and sustain therapeutic relationships and partnerships with patients (individual, family or group) and other professionals to facilitate optimal care and patient outcomes.

4. Demonstrate advanced levels of clinical judgment, systems thinking, and accountability in designing, delivering, and evaluating evidence-based care to improve patient outcomes.

5. Guide, mentor, and support other nurses to achieve excellence in nursing practice.

6. Educate and guide individuals and groups through complex health and situational transitions.

7. Use conceptual and analytical skills in evaluating the links among practice, organizational, population, fiscal, and policy issues.