ABSTRACT

A COMPARISON OF CAREGIVERS WITH ASTHMA AND CAREGIVERS WITHOUT ASTHMA IN FRESNO AND MADERA COUNTIES

The purpose of this study was to compare caregivers with asthma and caregivers without asthma in relation to their knowledge of asthma medication, asthma triggers, and preventative care utilization. A total of 35 caregivers were analyzed. The target population consisted of mostly Hispanic caregivers residing in Fresno and Madera Counties. Data were analyzed by utilizing the Statistical Package for the Social Science (SPSS). A total of five hypotheses were tested using Chi-Squared Fisher’s Exact test to compare caregivers with asthma and caregivers without asthma in relationship to (a) taking their children to a primary care physician, (b) taking their children to an asthma educator, (c) identifying asthma triggers in the home setting, (d) knowing how often their children should use a rescue inhaler, and (e) knowing how often their children should use a controller medicine. The study suggested there were no statistical differences between caregivers with asthma and caregivers without asthma in regard to taking their children to visit a primary care physician, asthma educator, or knowing how often their children should use a rescue inhaler. However, caregivers with asthma were more likely to identify triggers in their homes that made their children’s asthma worse and more likely to know when and how often their children should use their controller medication.

Audrey Jo Martinez
December 2012
A COMPARISON OF CAREGIVERS WITH ASTHMA AND CAREGIVERS WITHOUT ASTHMA IN FRESNO AND MADERA COUNTIES

by

Audrey Jo Martinez

A thesis
submitted in partial fulfillment of the requirements for the degree of
Master of Public Health
in the College of Health and Human Services
California State University, Fresno
December 2012
APPROVED

For the Department of Public Health:

We, the undersigned, certify that the thesis of the following student meets the required standards of scholarship, format, and style of the university and the student's graduate degree program for the awarding of the master's degree.

Audrey Jo Martinez
Thesis Author

Helda Pinzon-Perez (Chair) Public Health

Kara Zografos Public Health

Tim Tyner UCSF-Fresno

For the University Graduate Committee:

Dean, Division of Graduate Studies
AUTHORIZATION FOR REPRODUCTION
OF MASTER’S THESIS

I grant permission for the reproduction of this thesis in part or in its entirety without further authorization from me, on the condition that the person or agency requesting reproduction absorbs the cost and provides proper acknowledgment of authorship.

Permission to reproduce this thesis in part or in its entirety must be obtained from me.

Signature of thesis author:_____________________________
ACKNOWLEDGMENTS

I would like to thank the members of my thesis committee, Dr. Helda Pinzon-Perez, Dr. Kara Zografos and especially Tim Tyner, for their guidance and support. I would like to thank the Central California Asthma Collaborative for granting me the permission to utilize their data from their Central Valley Asthma Project. Most importantly, I would like to thank my parents, Richard and Lisa Martinez, for encouraging me to pursue my education and for supporting me financially in the process. Also, a special thank you to my sister, Angelina Aquino, for being there for me emotionally and providing me with continuous support. I appreciate all my family and friends who have given me positive advice and motivated me to reach my academic goal.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>LIST OF TABLES</th>
<th>vii</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CHAPTER 1: INTRODUCTION</strong></td>
<td>1</td>
</tr>
<tr>
<td>Background</td>
<td>1</td>
</tr>
<tr>
<td>Statement of the Problem</td>
<td>3</td>
</tr>
<tr>
<td>Purpose of the Study</td>
<td>4</td>
</tr>
<tr>
<td>Hypotheses</td>
<td>4</td>
</tr>
<tr>
<td>Limitations</td>
<td>5</td>
</tr>
<tr>
<td>Theoretical Framework</td>
<td>5</td>
</tr>
<tr>
<td>Steps of the Diffusion of Innovation Theory</td>
<td>7</td>
</tr>
<tr>
<td>Definition of Terms</td>
<td>9</td>
</tr>
<tr>
<td>Summary</td>
<td>10</td>
</tr>
<tr>
<td><strong>CHAPTER 2: LITERATURE REVIEW</strong></td>
<td>11</td>
</tr>
<tr>
<td>Barriers to Implementing Asthma Care</td>
<td>11</td>
</tr>
<tr>
<td>Intervention Education Programs Addressing Asthma</td>
<td>12</td>
</tr>
<tr>
<td>Asthma Education Programs and Medication Adherence</td>
<td>16</td>
</tr>
<tr>
<td>Asthma Education Programs and Averting Triggers</td>
<td>17</td>
</tr>
<tr>
<td>Asthma Education Programs and Knowledge</td>
<td>18</td>
</tr>
<tr>
<td>Asthma Education and Caregivers</td>
<td>18</td>
</tr>
<tr>
<td>Summary</td>
<td>22</td>
</tr>
<tr>
<td><strong>CHAPTER 3: METHODOLOGY</strong></td>
<td>23</td>
</tr>
<tr>
<td>Sample Selection and Setting</td>
<td>23</td>
</tr>
<tr>
<td>Instrumentation</td>
<td>23</td>
</tr>
<tr>
<td>Data Collection</td>
<td>24</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>24</td>
</tr>
<tr>
<td>Summary</td>
<td>25</td>
</tr>
<tr>
<td>CHAPTER 4: RESULTS</td>
<td>26</td>
</tr>
<tr>
<td>Hypotheses Testing</td>
<td>28</td>
</tr>
<tr>
<td>Summary</td>
<td>29</td>
</tr>
<tr>
<td>CHAPTER 5: SUMMARY, CONCLUSION, AND RECOMMENDATIONS</td>
<td>31</td>
</tr>
<tr>
<td>Summary of Hypotheses</td>
<td>31</td>
</tr>
<tr>
<td>Comparison to Other Studies</td>
<td>33</td>
</tr>
<tr>
<td>Implications for Public Health</td>
<td>34</td>
</tr>
<tr>
<td>Conclusions and Recommendations</td>
<td>35</td>
</tr>
<tr>
<td>Summary</td>
<td>37</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>39</td>
</tr>
<tr>
<td>APPENDICES</td>
<td>46</td>
</tr>
<tr>
<td>APPENDIX A: HUMAN SUBJECTS APPROVAL</td>
<td>47</td>
</tr>
<tr>
<td>APPENDIX B: NEEDS ASSESSMENT QUESTIONNAIRE</td>
<td>49</td>
</tr>
<tr>
<td>APPENDIX C: PERMISSION TO USE SECONDARY DATA</td>
<td>56</td>
</tr>
</tbody>
</table>
LIST OF TABLES

Table 1  *Descriptive Statistics and Differences in Care and Triggers for Caregivers with Asthma and Caregivers without Asthma* ..................................... 27

Table 2  *Descriptive Statistics and Differences in Medication for Caregivers with Asthma and Caregivers without Asthma* .............................................. 27
CHAPTER 1: INTRODUCTION

The purpose of this study was to compare caregivers with asthma and caregivers without asthma in relation to their knowledge of asthma medication, asthma triggers, and preventative care utilization. Asthma is a chronic disease that can be self-managed through patient education and health promotion (Watson et al., 2009). According to the American Lung Association (ALA, 2010b), adults and asthmatic children must initially learn more about the disease in order to obtain the ability to breathe easier.

Asthma is a chronic lung disease that causes individuals to experience difficulty breathing as a result of inflamed and constricted airways (Wolstein, Meng, & Babey, 2010). Raskin (2000) stated that asthma is a multifaceted disease that may be caused by a combination of allergenic, genetic, environmental, infectious, and socioeconomic influences. Asthma is characterized by its symptoms, such as wheezing, coughing, chest tightness, and trouble breathing (Asthma & Allergy Foundation of America [AAFA], n.d.). The National Heart, Lung, and Blood Institute (NHLBI, 2008) stated that people with asthma experience inflamed (swollen) airways, causing breathing complications. According to the ALA (2010b), over 20 million Americans are currently affected by asthma with over 7 million of those cases being children. According to Raskin (2000), children and families with asthma are faced with significant limitations on their quality of life.

**Background**

In the United States, asthma is a significant health issue impacting society as well as the individual suffering from the disease (Herman, 2010). Asthma in school-aged children has been shown to have an immense economic impact on
today’s society (Wang, Zhong, & Wheeler, 2005). Cuffwright (2008) stated the primary care sector carries a high burden, with childhood asthma consultations 29% higher than adult asthma visits. Raskin (2000) stated asthmatic children have been shown to utilize medical services substantially more often than non-asthmatic children. Wang et al. (2005) found the weighted per capita cost for asthmatic children was $1,042, as compared to $618 for children without asthma. It is clear that families with asthmatic children are spending more in medical costs as compared to families with non-asthmatic children (Wang et al., 2005).

From 1980 to 1994, childhood asthma rates increased by 160% (American Academy of Allergy Asthma & Immunology [AAAAI], 1996-2010). The rate of asthma worldwide is expected to rise to an alarming 100 million people by the year 2025 (AAAAI, 1996-2010). In California alone, there are more than 600,000 individuals who experience regular (daily or weekly) asthma symptoms. These persistent asthma symptoms are a key indicator of uncontrolled asthma (Wolstein et al., 2010).

One out of every 13 children who attends school is affected by asthma (U.S. Environmental Protection Agency [EPA], 2010). Studies have revealed that asthmatic children are absent more frequently than those non-asthmatic children (Moonie, Sterling, Figgs, & Castro, 2008). Moonie et al. (2008) suggested there is a close relationship between the academic performance of asthmatic children and absenteeism. In 2008, there were an astonishing 10.5 million missed schools days directly associated with asthma (EPA, 2012).

Asthma takes the lives of 250,000 people each year worldwide (American Academy of Allergy Asthma & Immunology [AAAAI], 1996-2010). In 2007, there were a reported 4,210 deaths, 504,000 hospitalizations, and 1,772,200 emergency room visits due to asthma, with an estimated cost of $14.7 billion
(Herman, 2010). According to the AAAI, the annual cost of asthma has been over $19 billion, with an additional $6 billion in costs for asthma medications (AAAI, 1996-2010).

Medicare and MediCal, California’s government-funded health insurance programs, reimburse on average 61% of the cost of hospitalizations due to asthma, costing California taxpayers approximately $547 million annually (California Department of Public Health [CDPH], 2007). Over 12% of children with a family income of less than 100% of the federal poverty level have asthma, compared to less than 10% of children with a family income between 100-200% of the federal poverty level, and 8.2% of children with a family income greater than 200% of the federal poverty level, as reported by the EPA (2012). This suggests that socioeconomic factors contribute to the higher incidence of asthma in lower income families and to the economic burden on our health care system.

**Statement of the Problem**

In California alone, there were an alarming 543 deaths in 2001 directly associated with asthma (Shaikh, Von Behren, Stockman, & Kreutzer, 2003). More than 5 million individuals living in California have been identified as having asthma, and of those 5 million, more than half have experienced asthma attacks annually (CDPH, 2010). According to the 2009 California Health Interview Survey [CHIS], the prevalence rate for asthma in the San Joaquin Valley is 17.3%, compared to California’s overall prevalence rate of 14.2%. Madera and Fresno County have two of the highest asthma prevalence rates in the state at 20.4% and 19.2%, respectively (CHIS, 2009).

Children and caregivers need health education programs to help with asthma management, identifying and responding to asthma symptoms, avoiding
asthma triggers, and properly using asthma medication to control asthma (Wolstein et al., 2010). Therefore, it is crucial to provide caregivers of asthmatic children with health education (Navaie-Waliser, Misener, Mersman, & Lincoln, 2004). According to Navie-Waliser et al. (2004), providing a health education program for caregivers of asthmatic children is a component in helping children and families adjust their environments and avert asthma attacks. It has been recognized for many years that health promotion programs are key components to minimizing future health problems (Poole, 1995) and that both caregiver and child need to be involved in any effort to properly manage and control asthma (CDPH, 2007).

Purpose of the Study

The purpose of this study was to compare caregivers with asthma and caregivers without asthma in relation to their knowledge of asthma medication, asthma triggers, and preventative care utilization. The Central California Asthma Collaborative (CCAC), a local non-profit organization, administered a needs assessment questionnaire to caregivers of asthmatic children. A secondary analysis was done on the data collected by this organization comparing caregivers with asthma and caregivers without asthma in relation to their knowledge of asthma medication, asthma triggers, and preventative care utilization addressed in CCAC’s multi-component home intervention program.

Hypotheses

The following hypotheses were tested in this study:

Hypothesis 1: There is no statistically significant difference between caregivers with asthma and caregivers without asthma in regard to taking their children to see primary care physicians in the last 12 months.
Hypothesis 2: There is no statistically significant difference between caregivers with asthma and caregivers without asthma in regard to taking their children to see asthma educators.

Hypothesis 3: There is no statistically significant difference between caregivers with asthma and caregivers without asthma in regard to identifying the triggers in their home that make their children’s asthma worse.

Hypothesis 4: There is no statistically significant difference between caregivers with asthma and caregivers without asthma in regard to knowing how often their children should use rescue inhalers.

Hypothesis 5: There is no statistically significant difference between caregivers with asthma and caregivers without asthma in regard to knowing how often their children should use controller medicines.

Limitations

The following limitations produced restricted findings in this study:

1. The questionnaire used to collect data was based on self-reporting.
2. This study is an analysis of secondary data.
3. Data were collected from 35 families in Fresno and Madera Counties, therefore the sample size was limited.
4. Sample demographics were not evenly distributed (predominantly Hispanic, female caregivers) and therefore may not be generalizable to larger population.

Theoretical Framework

Theories can be used to describe an individual’s behavior and provide different approaches that can help achieve a behavior change (Glanz, Rimer, & Lewis, 2002). Choosing a theoretical framework for a study is a crucial part in
evaluating an educational approach (McGhan, Wells, & Befus, 1998). The diffusion of innovations theory was taken as a framework for this study. According to Oldenburg and Parcel (2002), diffusion theory was developed from “a body of research that has attempted to identify predictable patterns of program adoption and diffusion by a variety of population groups and across a broad range of innovations” (p. 317). Rogers (2003) indicated “diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system” (p. 1). According to Rogers (2003), the diffusion of innovation theory explains how each individual in the social system is confronted with his/her particular innovation-decision. The innovation-decisions follow a five-step process.

1. **Knowledge**: the individual is self-aware of an innovation and understands the purpose.
2. **Persuasion**: the individual shapes either a positive or negative attitude toward the innovation.
3. **Decision**: the individual will connect with behaviors or actions that provide guidance toward acceptance or refusal of the innovation.
4. **Implementation**: the individual will utilize the innovation.
5. **Confirmation**: the individual will evaluate the outcome of an innovation-decision that has been made.

These stages are chronological and are established for the needs as well as reflecting both traits of the individual and apparent traits of the actual innovation (Rogers, 2003). The diffusion of innovations theory has been a valuable instrument for social change (Sharma & Kanekar, 2008).
Steps of the Diffusion of Innovation Theory

Knowledge – Step 1

Knowledge increases when individuals are exposed to new information and are able to increase an understanding of its importance (Rimer & Glanz, 2005; Rogers, 2003). A minimal amount of asthma education was administered in this study to inform and provide knowledge of asthma information through face-to-face interaction with families.

Persuasion – Step 2

During persuasion, individuals form opinions that may be favorable in regard to the new knowledge (Rimer & Glanz, 2005; Rogers, 2003). As the families discuss the information provided, they will form positive or negative attitudes toward the innovation. Interpersonal communication is considered the most successful in the persuasion step. Participants in this study were able to obtain the information from their participation and construct their own views as to whether or not they may make a suggested change or utilize new information they received.

Decision – Step 3

During the decision process, individuals choose whether to accept the new information provided (Rimer & Glanz, 2005; Rogers, 2003). The choices they make may depend on their perceptions of how the information pertains to them, whether it is beneficial, or their preferences. After the information was provided to the participants, they were free to accept or reject the new information provided.
Implementation – Step 4

During implementation individuals procure their new knowledge and incorporate it into their everyday lives by making it routine (Rimer & Glanz, 2005; Rogers, 2003). Benefits of implementing their new knowledge include a reduction in asthma triggers in the home and proper usage of asthma medication.

Confirmation – Step 5

In the last stage of the diffusion of innovation theory, the individual’s knowledge is incorporated into action and encouragement from the individual is displayed by encouraging others to use the information (Rimer & Glanz, 2005; Rogers, 2003). Families are familiar with the change and may carry out the behavior without a problem. During the confirmation step, the assimilation of knowledge is practiced by the families in this study.

The diffusion of innovations theory was used in an asthma program called “Asthma Amigo.” This program was designed to instruct untrained individuals out in the community known as asthma amigos, about the risk of asthma, asthma in the household (triggers), and ways to prevent asthma (Brooten et al., 2008). The program provided the participants with skills to communicate their knowledge with others in their environment (Brooten et al., 2008).

In relation to this study, having different channels of interaction (face to face, email, phone, written and visual) to communicate knowledge from one person to another has been deemed necessary. The different channels can include face-to-face interaction (Rogers, 2003), which was utilized in this study between the CCAC community health workers and families and asthma caregivers to understand their overall educational needs in regard to their children’s asthma.
Definition of Terms

The following terms are used throughout the study:

_Airways_ refers to tubes that circulate air throughout the lungs. People with asthma experience swollen and sensitive airways that cause the airways to become inflamed, making breathing complex (NHLBI, 2008).

_Asthma_ refers to a chronic disease that affects the lungs, causing the airways to become swollen, muscles to tighten, and extra mucus to form, which make it difficult for air to move in and out of the lungs (ALA, 2010a).

_Asthma education_ refers to information including asthma self-management, triggers, medication, written action plans and routine health care (Gibson, Ram, & Powell, 2003).

_Asthma self-management_ is the controlling of asthma at home to reduce its symptoms, emotional, and social burdens (Clark, 1989).

_Asthma symptoms_ occur when it is difficult for air to travel to the lungs, producing wheezing, coughing, chest tightness, loss of sleep, shortness of breath, or difficulty breathing (ALA, 2010a).

_Asthma triggers_ refers to things that cause asthma symptoms to occur, including physical activity, animals, smoke, dust, pollen, colds or flu, weather, and strong emotions (ALA, 2010a).

_Averting triggers_ refers to performing behaviors that limit (avoid) the exposure to asthma triggers (ALA, 2010a).

_Caregiver_ refers to an individual responsible for providing care for a dependent, such as a child or someone with an illness (Caregiver, 2010).

_Innovation_ refers to an idea or practice that is new to the individual or an organization (Rogers, 2003).
Medication adherence refers to “adherence to (or compliance with) a medication regimen. The extent to which patients take medications as prescribed by their health care providers” (Osterberg & Blaschke, 2005, p. 487).

Morbidity rate is the number of people who have poor health for the duration of a specific time frame (Doyle & Ward, 2001).

Mortality rate is the number of deaths that occur in a group or population (Doyle & Ward, 2001).

Prevalence is the fraction of the population affected by a disease at a certain point of time (Prevalence, 2010).

Secondary data are collected by someone else or for a purpose different from the current one (Secondary Data, 2009).

Self-efficacy is a person’s confidence level in demonstrating behaviors, which result in overcoming barriers (Bandura, 1977).

Summary

Asthma is a chronic disease that affects the lives of children throughout the United States (Akinbami & Schoendorf, 2002). Ways to make improvements in the intervention methods and care for asthma are a primary goal due to high rates of asthma morbidity, mortality, and health care expenditures (Bartholomew et al., 2006). According to Navaie-Waliser et al. (2004), understanding the educational needs of caregivers of asthmatic children is an important component in asthma education. This study compared caregivers with asthma and caregivers without asthma in Fresno and Madera Counties. An analysis of secondary data was done to identify potential participant differences related to key elements addressed in a multi-component home intervention program.
CHAPTER 2: LITERATURE REVIEW

The purpose of this study was to compare caregivers with asthma and caregivers without asthma in relation to their knowledge of asthma medication, asthma triggers, and preventative care utilization. This chapter is divided into six sections: (a) barriers to implementing asthma care, (b) asthma intervention education programs, (c) asthma education and medication adherence, (d) asthma education and asthma triggers, (e) assessment of asthma education and knowledge, and (f) asthma education and the role of caregivers.

Barriers to Implementing Asthma Care

There are four main barriers that can be identified as preventable factors for providing and implementing asthma care. According to the EPA (2012), the first preventable factor is medical care. Many asthma patients have restricted access to health care and education. The limited care can be illustrated by a lack of affordability, transportation, low health literacy, medication adherence, and cultural norms. The second preventable factor includes physical and psychosocial environmental factors. There are many things that can exacerbate asthma, such as exposures to pollutants found in the home and in schools. Also, lack of resources for the family’s suffering from asthma and lack of support provided from the surrounding community can be perceived as a barrier. Individuals exposed to elevated levels of stress and heightened violence are shown to have an increase in asthma symptoms. The ability to obtain secure housing and daily essentials impact a family’s ability to self-manage and control a child’s asthma. The third preventable factor is the lack of local capacity to deliver community-based, integrated, comprehensive asthma care. There are limited numbers of partnerships focused on comprehensive asthma care at the community-level. The last
preventable factor is the gap in capacity to identify and reach children most at risk. There are minimal amounts of data accumulated at the local, state, and national levels and innovative technologies in regard to recognizing, tracking, and providing education (EPA, 2012). Families need comprehensive programs aimed at providing asthma resources and education in the home and school setting while providing better access to health care.

**Intervention Education Programs Addressing Asthma**

Asthma is one of the most common chronic diseases among children (Bernard-Bonnin, Stachenko, Bonin, Charette, & Rousseau, 1995). Asthma is a disease that does not discriminate according to gender, age, or ethnicity (Bernard-Bonnin et al., 1995). According to Bernard-Bonnin et al. (1995), making asthma education a priority for children and their families is important in formulating an effort to alleviate the morbidity related to asthma. Assessment and treatment for asthma can be seen as very complex issues, nevertheless, they are the most crucial parts of asthma control (Bukstein, Kraft, Liu, & Peters, 2006). Asthma education is an important approach of addressing asthma (Bukstein et al., 2006).

Parent education builds self-management skills in asthmatic children (The Consortium on Children’s Asthma Camps, n.d.). Strengthening the ability of caregivers to support asthmatic children to better manage their disease is a key component in asthma management (The Consortium on Children’s Asthma Camps, n.d.).

According to Kallstrom (2004), education is the most successful elongated approach to the management of asthma (Kallstrom, 2004). It is vital that families and caregivers acquire the ability to care for themselves or other family members outside the clinical setting. Focusing on education for the patients and caregivers
will provide skill building, confidence, and motivation to control their asthma. Asthma education not only provides an increase in knowledge of the disease for the patient and family, it has the ability to reduce anxiety in the caregivers.

Asthma education in different environments can pose an opportunity. As stated by Kallstrom, “home-based programs may serve to bridge the gap between best practice and putting practice into action” (Kallstrom, 2004, p. 208). A face-to-face setting with caregivers of asthmatic children is considered the most effective method of asthma education. It is important for programs to provide inclusive asthma education in a community surrounding that bestows knowledge and self-management skills for both the caregiver and children as the main focus (The Children’s Hospital of Philadelphia, 1996-2011). When educating families and caregivers about asthma it is crucial to highlight key components without overwhelming them with too much information (Kallstrom, 2004). According to Kallstrom (2004), asthma education for families and caregivers should focus on medication, environmental control measures (triggers), and self-monitoring techniques.

Evans et al. (1987) indicated there are three main objectives in successfully providing an intervention-education program: (a) focus efforts on teaching the child and engaging parent participation, (b) provide parents with skills to make positive decisions related to asthma management and influence children to procure appropriate actions to assist their parent’s in this process, and (c) investigate new behaviors the child makes and to enforce self-efficacy in the acceptance and continued asthma self-management behaviors. Educational programs that focus on teaching skills to utilize asthma medication properly have the strongest impact on morbidity measures (Guevara, Wolf, Grum, & Clark, 2003). It is important for caregivers and children to have the skills and tools to self-manage their asthma.
A study was conducted in two New York City school districts observing 12 public elementary schools that agreed to participate in the study (Evans et al., 1987). Letters were sent out to all the parents of the participant’s grades 3 through 5 with a description of the program and a definition of asthma. The recruitment process was made broad to ensure an overall fairness in the primary process of the study. Parents interested in the school-based asthma education program either responded to the letter or responded by telephone, giving consent for their children’s participation in the program. After the recruitment process, the study obtained a population of 239 children, 93% of whom had been diagnosed with asthma. The majority of the population in the study was low income and a prevailing number were Hispanic or African American. All 12 schools were matched in regard to their size and ethnic composition. After each school was matched together, one of the schools was randomly chosen to receive the school-based asthma intervention. The results of the study showed (a) an increase in children taking action to manage their asthma, (b) an improvement in the participants’ self-efficacy skills, and (c) a decrease in asthma episodes in the intervention group compared to the control group. However, the authors noted that the results of the study pose some questions regarding selection bias and may not lead to generalized findings among other ethnicities or school settings (Evans et al., 1987).

Christiansen et al. (1997) conducted a study addressing school-based asthma education with students in San Diego Unified schools. The asthma education program provided a curriculum aimed at fourth grade children addressing key factors, such as asthma knowledge or management, averting triggers, and medication adherence. The program was held over a 5-week period during school time, with each lesson lasting approximately 20 minutes. The
participants were given handouts explaining the key points of each lesson, in addition to appropriate materials to share with their families and caregivers. An asthma quiz and medication techniques were administered in a pre- and post-test form for pre- and post-education assessment. Small incentives were provided for the participants, as well as a graduation ceremony when the program was completed. The participants in the asthma education program were then compared to a control group made up of students with asthma who did not participate in the program. Results from the study demonstrated an improvement in asthma knowledge and an improvement in medication adherence associated with students who participated in the program. Christiansen et al. (1997) stated that programs centered on asthma self-management have been effective methods of reporting the overall nature of the disease and, most importantly, educating children on appropriate ways to control their illness.

Another study was conducted in 2005 that evaluated the effects of an asthma education intervention based on the ALA’s Kickin’ Asthma curriculum. Zografos (2007) examined Bandura’s social cognitive theory (SCT) and focused on adolescents 12-18 years of age. An 88-item questionnaire that focused on knowledge, intention, behavior, self-efficacy, and self-consciousness was administered. A total of 87 participants from six schools in Fresno and Clovis Unified School Districts took part in this study. The Kickin’ Asthma program included six asthma education sessions, 40 minutes each, over a 3-week period. Session 1 focused on administering the pre-test. Session 2 provided participants with information on the definition of asthma and the pathophysiology of asthma. Session 3 discussed early warning signs and asthma triggers. Session 4 concentrated on asthma medication and devices (how to properly administer asthma medication). Session 5 focused on the social outcome expectations in
regard to how the asthmatic children’s peers react. During the last session, the post-test was administered to the participants. Results indicated significant improvements in knowledge, intention, self-efficacy, and behavior. This study also demonstrated that the school-based asthma education curriculum (Kickin’ Asthma) had positive effects on the asthmatic adolescents sampled in this study.

Asthma Education Programs and Medication Adherence

Being able to follow medication recommendations from a physician can determine poor or good asthma control (Weinstein, 2004). Weinstein (2004) reported that half of the patients diagnosed with asthma did not follow a physician’s medication recommendations. Those individuals who suffered from severe asthma could have experienced difficulty complying with medication orders. It was reported that of the 28% of individuals with asthma who own a peak flow meter, only 9% were reported to be using it at least once a week to help manage inhaler use (Bukstein et al., 2006). Being able to properly educate and strategically improve adherence to medication can improve and reduce the morbidity of asthma (Weinstein, 2004). As noted by Christiansen et al. (1997), an asthma education program performed in a school environment can result in improvement in peak flow meter skills and proper inhaler use.

A study was conducted to examine the effectiveness of a school-based asthma program relating to medication adherence. McEwen, Johnson, Neatherlin, Millard, and Lawrence (1998) investigated 22 African-American school-aged children, ranging from 5 to 12 years of age, attending an inner-city elementary school in Dallas, Texas. Over a 3-month period, participants in the program proceeded to the school clinic two times a day for a demonstration on medication management and peak flow meter measurements. This particular program was
intended to prevent exacerbations of asthma symptoms and increase utilization of inhaled anti-inflammatory asthma medication. The study results showed a 15% improvement in mean peak flow rates, an overall increase in their controller medication use, and improvements (decrease) in self-reported asthma symptoms (McEwen et al., 1998).

**Asthma Education Programs and Averting Triggers**

According to Brown, Meng, Babey, and Malcolm (2002), the NHLBI suggested that individuals who have been diagnosed with asthma be educated on ways to manage their asthma and avoid environmental triggers. Reducing one’s exposure to asthma triggers, such as air pollutants, smoke, colds, dust mites, pets, pollens, and molds is key to decreasing the frequency of asthma episodes (Brown et al., 2002). Providing asthma education to children, who in turn reiterate the lessons to their parents or guardians, is important when averting asthma triggers, as parental education has been demonstrated to be crucial in addressing environmental triggers (Cabana et al., 2004).

As stated previously, an educational lesson on asthma triggers and how to avoid them can benefit asthmatic children (Meng & McConnell, 2003). Meng and McConnell (2003) indicated how demonstrating fun and educational lessons can remind a child with asthma on ways to avert their triggers. For example, activities such as the handshake game (having one child dip his hands in glitter and then shake other students’ hands) relay the message of how germs spread from one person to the next and teaches asthmatic children the importance of hand washing in avoiding asthma triggers like cold and flu viruses (Meng & McConnell, 2003).
Asthma Education Programs and Knowledge

Health education programs aimed at asthmatic children increase knowledge, promote positive behavior changes, and decrease the usage of health services related to asthma episodes (Brazil, McLean, Abbey, & Musselman, 1997). School-based asthma education programs can be successful for their participants by increasing patient knowledge (Christiansen et al., 1997).

Coffman, Cabana, and Yelin (2009) conducted a review of literature on studies that were focused on school-based asthma education programs for children. Ten studies were reviewed to evaluate the impact of school-based asthma education programs on children’s asthma. Seven of the 10 studies determined there was a statistically-significant increase in knowledge related to asthma education. Only one study out of the 10 showed there was a statistically-significant increase in knowledge for children in grades 1 and 2, but not for children in grades 3 and 5. The three studies that did not show statistically significant increase in knowledge, determined there were significant differences when comparing the intervention (asthma education) and control groups (no asthma education) related to knowledge. Coffman et al. (2009) reported the overall implication of the review established that school-based asthma education programs do improve a child’s knowledge of asthma. The review of the studies did, however, suggest that “some of the studies may not have had sufficient power to identify differences between the intervention and control groups for some or all of the outcomes” (Coffman et al., 2009).

Asthma Education and Caregivers

Caregivers of asthmatic children have missed work days and lost productivity, while their children have shown an increase in health care utilization as well as health care costs (Georgiou et al., 2003). A study was conducted on a
disease management program that evaluated the benefit of educating asthmatic children and their adult caregivers. The program was implemented by a large, health care plan and evaluated 401 randomly selected families across 17 different regional markets in the US. The participants in the study completed an Asthma Quality Assessment survey prior to and 12 months after completing the asthma management program. The program consisted of participants receiving an educational booklet, asthma treatment guides, and asthma-related issues, addressing triggers, symptoms and medication in the mail. For participants whose children were deemed high risk, based on their baseline survey responses, an intensive “Telephonic Care Management” option was offered which involved registered nurses and a respiratory therapist providing participants with feedback, and an asthma control kit that included a peak flow meter and an educational video. The results of this study concluded that the participants in the asthma management program were responsive to the educational materials provided, there was a reduction in nighttime symptoms for the child with asthma, there were positive changes in asthma management behavior, and an improvement in the caregiver’s work attendance. These findings support the postulation that multi-level community-based programs benefit asthmatic children and their caregivers.

Caring for a child with asthma can affect the caregiver’s well-being and coping strategies (Dolinar, Kumar, Coutu-Wakulczyk, & Rowe, 2000). A pilot test was conducted on families with children under the age of 11 years with stable asthma and had visited the pediatrician’s office for consistent care (Dolinar et al., 2000). These families were randomly placed in an intervention group (participated in a one-time, 2-hour, home-based asthma education session) or the control group (received a booklet containing information on basic asthma care). One and 3-month assessment follow-ups were measured in this study. The follow-up
assessments included quality of life and change in asthma. Forty families were recruited to participate in the study (20 in each group). The study’s findings suggested home-based educational intervention improves the coping and quality of life for caregivers of asthmatic children. Dolinar et al. (2000) indicated there are limited evaluations done on home-based educational delivery methods, but these pilot test results suggested it may be a valuable method of providing education to families as a unit.

In 2005, a study was conducted in the inner city of Baltimore that focused on providing environmental interventions to decrease indoor allergens and asthma triggers (Hansel et al., 2005). There were 150 caregivers of asthmatic children surveyed in this study. Caregivers were questioned regarding their indoor exposures and environmental practices. The study reported that caregivers were able to target common indoor triggers, such as cockroaches or mice, but were not able to target other environmental control practices or triggers. The study concluded that caregivers of asthmatic children need better guidance on indoor triggers and control.

Martin, Hernandez, Naureckas, and Lantos (2006) conducted a pilot test with low income families in the inner city of Chicago. The study partnered with a community center that employed community health workers to provide a 2-hour home-intervention asthma education. A total of 103 Spanish-speaking Hispanics with asthma participated, including 56 children, (42 were caregivers) and 47 adults. The community health workers focused the asthma education on asthma physiology, triggers, myths, and medication demonstration. A survey was completed and spirometry measures were collected from the participants at the beginning and end of the study. The community health workers visited the homes 3, 6, and 12 months after the initial visit to conduct follow-ups. The results of the
pilot test suggested home-based asthma education administered by community health workers is associated with a reduction in asthma triggers in the home for both the children and adults with asthma. Confounding factors assessed in this study included caregiver gender, ethnicity, marital status, education level, acculturation level, health insurance, and years lived in the U.S.

Brown et al. (2002) conducted a study focused on a home-based education program adapted from the “Wee Wheezers” program and geared it for low-income caregivers of young asthmatic children. Of the 95 participants, most were African American. Participants were recruited during their clinic visits, by letters, or by telephone calls. The home-based asthma education program consisted of eight sessions lasting 90 minutes over a period of several weeks. Caregivers and children participated in educational activities and after each session were asked questions based on their understanding of the information provided. The results of the study concluded home-based asthma education programs were most effective with younger children. This study similarly considered caregiver age, gender, education level, and employment as factors contributing to the study outcome.

The literature illustrates that studies have examined a caregiver’s knowledge and understanding of asthma by looking at age, gender, ethnicity, socioeconomic status, education level, marital status, employment, health insurance, acculturation level, and the number of years residing in the US. One factor that has yet to be examined is the health status of the caregivers (e.g., caregivers who also have asthma vs. those who do not). It has reported that if one parent has asthma, there is a 33% chance that their child will have asthma and, whereas if both parents have asthma, there is a 70% chance that their child will have asthma (AAFA, n.d.). According to Clougherty, Kubzansky, Spengler, and Levy (2009), several caregivers of asthmatic children have recurrent asthma
themselves and consequential improvements in their health could impact perceptions about their children’s asthma. Based on these facts, this study seeks to contribute to the field of public health by addressing this group of caregivers.

Summary

The purpose of this study was to compare caregivers with asthma and caregivers without asthma in relation to their knowledge of asthma medication, asthma triggers, and preventative care utilization. An analysis of secondary data identified potential participant differences related to key elements addressed in a multi-component home intervention program. The literature review discussed the importance of educational intervention programs that addressed asthma. In addition, the literature review described medication adherence, averting triggers, self-knowledge, and a caregiver’s role as factors conducive to asthma education. The medication adherence section provided an understanding of the link between asthma education for caregivers and the proper use of medication for their asthmatic children. The averting triggers section described different educational factors contributing to the reduction of exposure to environmental triggers, such as demonstration and parental education. The knowledge section demonstrated a significant increase in knowledge for children who participated in asthma education programs. The caregivers and asthma section described the role the caregiver plays in asthma management for children and the importance of addressing the caregiver’s educational needs.
CHAPTER 3: METHODOLOGY

The purpose of this study was to compare caregivers with asthma and caregivers without asthma in relation to their knowledge of asthma medication, asthma triggers, and preventative care utilization. An analysis of secondary data identified potential participant differences related to key elements that can be addressed in a multi-component home intervention program. Approval was given by Fresno State University’s, Institutional Review Board (IRB) for the researcher to analyze secondary data associated with human subjects (see Appendix A). This study analyzed a 22-item questionnaire (see Appendix B) collected by the Central California Asthma Collaborative (CCAC) as a component of their home intervention program. This chapter describes the study being conducted, sample selection and setting, instrumentation, data collection and analysis.

Sample Selection and Setting

The study focused on English-speaking families residing in Fresno and Madera Counties who were referred by Clinical Sierra Vista, Madera County Department of Public Health, and Camerena Health. The total population in the study included 35 randomly selected caregivers of children with asthma. The study included home visits between June 4 and September 7, 2012. Trained CCAC community health workers visited each participant’s home to conduct an educational needs assessment with the child and caregiver.

Instrumentation

The community health workers verbally administered a 22-item questionnaire to each participant. De-identified data were subsequently provided to the researcher to conduct a secondary analysis (see Appendix C). The first
section of the questionnaire was based on the demographics of each participant. The second section focused on the patient’s information regarding grade level, having an asthma action plan, and sibling and/or parents having asthma. The remaining questions were related to (a) asthma medications (b) asthma triggers, (c) scheduling visits with primary care physician and/or asthma educator, (d) impairments due to asthma, and (e) additional school information.

Data Collection

All the data used in this study were collected and carried out by trained CCAC community health workers. The community health workers participated in intensive training and shadowed a health educator in the field, ensuring proper protocols were followed on how to administer the questionnaires to selected participants.

Caregivers who participated in CCAC’s multi-component home intervention program went through each of the program steps, including the needs assessment questionnaire, an environmental home assessment, and focused asthma education. The participants in this study signed a form authorizing CCAC and their partners to utilize the survey responses and other de-identified data for research purposes (i.e., without disclosure of any personal information).

Data Analysis

The Statistical Package for Social Sciences was used for the analysis of the data in this study. Data were provided to the researcher without any identification information related to the participants. To compare caregivers with asthma and caregivers with asthma of asthmatic children, a Chi-Squared Fisher’s Exact test was used to test five null hypotheses in this study. This test considered most appropriate by the researcher, as the selected data were primarily nominal
(categorical) and two groups being compared with equal variables tested. A small sample size was analyzed in this study resulting in several variables with fewer than 5 participant responses, therefore requiring the application of a Fisher’s Exact test was the most applicable for this study. This data analysis procedure analyzed the relationship between caregivers with asthma and caregivers without asthma in regard to (a) taking their children to see primary care physicians, (b) taking their children to see asthma educators, (c) identifying the things in their homes that make their children’s asthma worse, (d) knowing how often their children should use their rescue inhalers, (e) and knowing how often their children should use their controller medicine.

Summary

Chapter 3 provided information on the research methodology of this study and the data analysis employed. This study was conducted to compare caregivers with asthma and caregivers without asthma in Fresno and Madera Counties. An analysis of secondary data was conducted in this study to identify potential participant differences related to key elements that can be addressed in a multi-component home intervention program.
CHAPTER 4: RESULTS

The purpose of this study was to compare caregivers with asthma and caregivers without asthma in relation to their knowledge of asthma medication, asthma triggers, and preventative care utilization. A non-parametric Chi-Squared Fisher’s Exact test was used to compare the difference between caregivers with asthma and caregivers without asthma in relation to five variables associated with the caregiver educational curricula. This chapter discusses the study findings.

Participants were predominately Hispanic/Latino (77.2%) and the majority of participants (caregivers) were female (97%). Participants in this study agreed to participate in CCAC’s home assessment program and allow their de-identified responses to be used for research purposes. As part of the program, participants completed a verbally administered 22-item assessment questionnaire.

Table 1 illustrates the number of participants who responded to the questions analyzed in this study and the percentage of caregivers with or without asthma who indicated “yes” or “no” for each of the variables.

For this study, the Chi-Squared test was used to examine the data findings. A Fisher’s Exact test was used since some response values were less than 5. Table 1 also illustrates the differences in variables between caregivers with asthma and caregivers without asthma, illustrated with the $\chi^2$ and $p$ value, respectively.

Table 2 illustrates the number of participants who responded to the questions analyzed in this study, specifically, the percentage of caregivers with or without asthma who indicated “as needed,” “every day,” “one time per day,” or “two times per day” for each of the variables. Table 2 also illustrates the differences in variables between caregivers with asthma and without asthma, illustrated with the $\chi^2$ and $p$ value, respectively.
### Table 1

*Descriptive Statistics and Differences in Care and Triggers for Caregivers with Asthma and Caregivers without Asthma*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Yes n (%)</th>
<th>No n (%)</th>
<th>χ²</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary care physician visit in the last 12 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caregiver with asthma</td>
<td>16 (88.9)</td>
<td>2 (11.1)</td>
<td>.503</td>
<td>.478</td>
</tr>
<tr>
<td>Caregiver without asthma</td>
<td>12 (80.0)</td>
<td>3 (20.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthma educator seen</td>
<td>8 (44.4)</td>
<td>10 (55.6)</td>
<td>2.200</td>
<td>.138</td>
</tr>
<tr>
<td>Caregiver with asthma</td>
<td>3 (20.0)</td>
<td>12 (80.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caregiver without asthma</td>
<td>8 (44.4)</td>
<td>10 (55.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthma triggers identified in home</td>
<td></td>
<td></td>
<td>7.187</td>
<td>.007</td>
</tr>
<tr>
<td>Caregiver with asthma</td>
<td>12 (66.7)</td>
<td>6 (33.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caregiver without asthma</td>
<td>3 (20.0)</td>
<td>12 (80.0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 2

*Descriptive Statistics and Differences in Medication for Caregivers with Asthma and Caregivers without Asthma*

<table>
<thead>
<tr>
<th>Variables</th>
<th>As needed n (%)</th>
<th>Every day n (%)</th>
<th>One time per day n (%)</th>
<th>Two times per day n (%)</th>
<th>χ²</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rescue inhaler used</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.472</td>
<td>.324</td>
</tr>
<tr>
<td>Caregiver w/ asthma</td>
<td>12 (80.0)</td>
<td>1 (6.7)</td>
<td>0 (0.0)</td>
<td>2 (13.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caregiver w/o asthma</td>
<td>6 (60.0)</td>
<td>1 (10.0)</td>
<td>2 (20.0)</td>
<td>1 (10.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controller medicine used</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17.600</td>
<td>.001</td>
</tr>
<tr>
<td>Caregiver w/ asthma</td>
<td>0 (0.0)</td>
<td>2 (14.3)</td>
<td>5 (35.7)</td>
<td>7 (50.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caregiver w/o asthma</td>
<td>8 (80.0)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>2 (20.0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Hypotheses Testing

Hypothesis 1
There is no statistically significant difference between caregivers with asthma and caregivers without asthma with regards to taking their children to see a primary care physician in the last 12 months. At an alpha of 0.05, the decision was to fail to reject the null hypothesis (see Table 1). Therefore, there was no identified significant difference between the two groups.

Hypothesis 2
There is no statistically significant difference between caregivers with asthma and caregivers without asthma in regard to taking their children to see an asthma educator. At an alpha of 0.05, the decision was to fail to reject the null hypothesis (see Table 1). Therefore, there was no identified significant difference between the two groups.

Hypothesis 3
There is no statistically significant difference between caregivers with asthma and caregivers without asthma in regard to identifying the triggers in their home that makes their children’s asthma worse. At an alpha of 0.05, the decision was to reject the null hypothesis (see Table 1). Therefore, there was a significant difference between the two groups. The Chi-Squared test ($\chi^2=7.187$, $p<0.05$) indicated that caregivers with asthma were more likely to identify their children’s asthma triggers in the home better than caregivers without asthma (see Table 1).
Hypothesis 4

There is no statistically significant difference between caregivers with asthma and caregivers without asthma in regard to knowing when their children should use a rescue inhaler. At an alpha of 0.05, the decision was to fail to reject the null hypothesis (see Table 2). Therefore, there was no identified significant difference between the two groups.

Hypothesis 5

There is no statistically significant difference between caregivers with asthma and caregivers without asthma in regard to knowing when their children should use a controller medicine. At an alpha of 0.05, the decision was to reject the null hypothesis (see Table 2). Therefore, there was a significant difference between the two groups. The Chi-Squared test ($\chi^2=17.600$, $p < 0.05$) demonstrated that caregivers with asthma knew better when to administer their children’s controller medicine as compared to caregivers without asthma.

Summary

After completing the test of the study’s five hypotheses, it was concluded that the comparison of caregivers based on their personal health (asthma) status revealed there were no significant differences in regard to whether caregivers had taken their children to see a primary care physician or asthma educator. There was, similarly, no significant difference in their knowledge regarding how often their children should use a rescue inhaler. However, when comparing caregivers with asthma and caregivers without asthma in regard to knowing their children’s asthma triggers at home and knowing how often their children should use a controller medicine, there was a significant difference between the two groups. Caregivers with asthma were more likely to identify their children’s asthma
triggers in the home than were caregivers without asthma. Caregivers with asthma were also more likely to know when and how often their children should take a controller medicine. Therefore, asthmatic children of caregivers with asthma are more likely to take controller medication properly and potentially avoid or reduce asthma triggers in the home, as compared to asthmatic children of caregivers without asthma.
CHAPTER 5: SUMMARY, CONCLUSION, AND RECOMMENDATIONS

The purpose of this study was to compare caregivers with asthma and caregivers without asthma in relation to their knowledge of asthma medication, asthma triggers, and preventative care utilization. The researcher utilized information provided by the Central California Asthma Collaborative (CCAC), including survey responses from a total of 35 adult caregivers of asthmatic children. This chapter presents a summary of the results, conclusions generated as a result of this study, and recommendations for future research.

Summary of Hypotheses

No personal information was provided to the researcher to safeguard the privacy of the participants. The data were collected by CCAC community health workers using a 22-item questionnaire during the summer of 2012. This researcher input data into SPSS and analyzed them with a Chi-Squared Fisher’s Exact test.

Hypothesis 1

The null hypothesis, stating that there is no statistically significant difference between caregivers with asthma and caregivers without asthma in regard to taking their children to see a primary care physician in the last 12 months failed to be rejected. The Chi-Squared test indicated no difference between the caregiver groups and seeing a primary physician (see Table 1, p. 27). The Chi-Squared results ($\chi^2=.503$, $p > 0.05$) illustrated that caregivers with asthma and caregivers without asthma took their children to visit a primary care physician with the same relative frequency.
**Hypothesis 2**

The null hypothesis, declaring that there is no statistically significant difference between caregivers with asthma and caregivers without asthma in regard to taking their children to see an asthma educator failed to be rejected. The Chi-Squared test revealed no statistically significant difference between the two groups of caregivers (see Table 1, p. 27). The Chi-Squared results ($\chi^2=2.200$, $p > 0.05$) indicated that caregivers with asthma similarly take the child to see an asthma educator with the same frequency as caregivers without asthma.

**Hypothesis 3**

The null hypothesis, stating that there is no significant difference between caregivers with asthma and caregivers without asthma in regard to identifying the triggers in their home that makes their children’s asthma worse, was rejected, meaning there was a significant difference. The Chi-Squared test ($\chi^2=7.187$, $p < 0.05$) indicated that caregivers with asthma were more likely to identify their children’s asthma triggers in the home better than caregivers without asthma (see Table 1, p. 27).

**Hypothesis 4**

The null hypothesis, stating that there is no statistically significant difference between caregivers with asthma and caregivers without asthma in regard to knowing how often their children should use a rescue inhaler, failed to be rejected. The Chi-Squared test showed no statistically significant differentiation between caregivers in regard to knowing when their children should use their rescue inhalers (see Table 2, p. 27). The Chi-Squared results ($\chi^2=3.472$, $p > 0.05$) illustrated that the majority of caregivers, regardless of asthma, similarly replied that their children used their rescue inhalers “as needed.”
Hypothesis 5

The null hypothesis, stating there is no statistically significant difference between caregivers with asthma and caregivers without asthma in regard to knowing when their children should use a controller medicine, was rejected. The Chi-Squared test ($\chi^2=17.600$, $p < 0.05$) demonstrated that 85% of caregivers with asthma reported their children used controller medicine daily or twice daily, compared to 20% of caregivers without asthma. Similarly, 80% of caregivers without asthma responded that their children used controller medicine “as needed,” as compared to 0% of caregivers with asthma. Caregivers with asthma knew better when to administer their children’s controller medicine as compared to caregivers without asthma.

Comparison to Other Studies

Previous studies have demonstrated a need for asthma education programs in school settings for children and in home-based settings aimed at caregivers and families as a unit. Georgiou et al. (2003) conducted a study to measure the benefit of a large, national program for asthmatic children and their caregivers. Study participants (caregivers of asthmatic children) were given an Asthma Quality Assessment survey before the state of the program and 12 months after the program was complete. Though this study was on a much larger scale than the local program assessed by the researcher, there were similarities in the asthma education approaches. This study demonstrated that the program they were evaluating was of benefit to caregivers and their children (as written it suggests that the study and the program are one in the same).

In 2000, Dolinar et al. conducted a pilot study looking at the benefit of a home-based education program. Dolinar et al. (2000) concluded that a home-based
program is a successful approach to providing caregivers of asthmatic children with the materials to improve their coping skills and quality of life.

A study conducted by Hansel et al. (2005) similarly showed the importance of providing asthma education for caregivers of asthmatic children. Similar to the researcher’s study, this study showed the need to provide caregivers of asthmatic children better guidance on indoor triggers and help them identify and use better control measures.

A pilot test conducted by Martin et al. (2006) similarly showed the need for a home-based asthma education program conducted by community health workers. This study focused on a Hispanic population and examined factors such as gender, ethnicity, marital status, education level, acculturation level, health insurance, and years lived in the U.S. among caregivers of asthmatic children.

Unlike previous studies, the researcher addressed the health status of the caregivers (i.e. whether or not they too had asthma) in regard to asthma triggers in the home. The study showed an association between caregivers with asthma being able to identify their children’s asthma triggers in the home better than caregivers without asthma.

**Implications for Public Health**

This study contributes to the field of public health by illustrating the need for education aimed at caregivers, especially those who do not have asthma. Educating caregivers of asthmatic children is essential for the well-being of the child and empowers children to take control of their asthma. This study can serve as a model for individuals to recognize the importance of providing education not only to the children who have asthma, but also to the caregivers, regardless of his or her own asthma status.
Half of the caregivers in this study stated they had asthma themselves and the results of the study revealed they were knowledgeable in administering their children’s asthma medications and identifying asthma triggers better than caregivers who did not have asthma. This study illustrated the importance of assessing the caregiver’s health status in order to determine the level of asthma education needed for both the child and the caregiver.

This study is an example of a minimal-size population and can be used as a baseline for future studies with similar intent. This study may also help reiterate the importance of involving caregivers of asthmatic children by not only developing asthma programs in the school setting, but also in the home. Home-based asthma education is essential in providing caregivers with knowledge and the skills to properly manage their children’s asthma. Public health is a discipline that involves educational endeavors leading towards improvement of health outcomes (Kass, 2001). This study contributed towards the identification of educational needs of the participants in the study.

Conclusions and Recommendations

This study’s literature findings provide support for future implementation of home-based asthma education programs for caregivers and children. This study demonstrated that caregivers with asthma and caregivers without asthma manage their children’s asthma similarly in regard to access to care and administering quick-relief medications. However, this study also illustrated that caregivers with asthma are able to identify their children’s asthma triggers in the home better than caregivers without asthma and that asthmatic children of caregivers with asthma are more likely to properly use a controller medication.
Asthma education is essential for children with asthma and their caregivers. Many programs target asthma on different levels, whether it is school-based education, home-based education, or clinically-based education. Each level is essential and contributes to the implementation of asthma self-management. Ongoing collaboration is critical in establishing, implementing, and sustaining programs that offer resources on more than one level. A multi-faceted approach to asthma education can address some of the disparities that arise from asthma, including ethnic and socioeconomic disparities. Kallstrom (2004) stated opportunities would surface when asthma education is made available in different environments. The California Asthma Collaborative (CCAC) is in the beginning stages of addressing the burden of asthma in the San Joaquin Valley. The organization’s approach of using a multi-component program to address asthma education in the home, school, and provider settings leverages numerous opportunities to impact the child and family’s life.

Literature illustrates that asthma education programs are effective. Education is shown to be the most effective method in regards to controlling and managing asthma (Kallstrom, 2004). A multi-level community-based asthma program benefits children with asthma and their caregivers (Georgiou et al., 2003). This study examined a home-based component, where baseline information was collected from caregivers of asthmatic children and asthma education was taught to the child and caregiver. The asthma education included knowing the difference and importance of controller and rescue medications, how to properly administer inhaled asthma medicines and review of common environmental, physical, and emotional elements that may trigger an asthma exacerbation. The researcher used the baseline information that was collected from 35 participants in the program. Through the study’s literature findings the researcher concluded asthma education
is vital for caregivers of asthmatic children whether or not the caregivers have asthma themselves.

The researcher acknowledges that due to the demographic distribution of study participants, the study’s findings may not be generalizable and would therefore require some follow-up research. For example, this study examined only female caregivers, raising the question of whether the results would be similar for male caregivers of asthmatic children. Additionally, the study focused predominantly on Hispanic caregivers, similarly bringing into question the applicability of the findings to other ethnicities. Also, the question of whether there were educational differences between the two groups (caregivers with asthma and caregivers without asthma) that may have contributed to the identified differences in responses cannot be determined. Lastly, the question of whether the caregivers with asthma were more informed and/or aware because they previously received information about their own asthma (like knowing when to administer their controller medication), or whether they were simply more engaged/involved with learning how to care for their child’s asthma, cannot be discerned from this study. The following recommendations are also suggested based on this study: (a) collect qualitative data when the baseline information is collected to specifically identify educational areas to be addressed by public health practitioners, (b) encourage bilingual families to participate in the program by providing bilingual staff, and (c) make efforts to remediate the homes by providing home improvement incentives as needed.

**Summary**

The purpose of this study was to compare caregivers with asthma and caregivers without asthma in relation to their knowledge of asthma medication,
asthma triggers, and preventative care utilization. An analysis of secondary data identified potential participant differences related to key elements addressed in a multi-component home intervention program. Understanding the educational needs of caregivers of asthmatic children is important. There are numerous factors that affect asthma education, such as barriers to care, medication adherence, averting triggers, access to a primary care physician, and the caregiver’s role. After analyzing the data, it appears that caregivers with asthma are more likely to identify their children’s asthma triggers in the home and to know proper administration of controller medicine, as compared to caregivers without asthma. This study’s findings illustrate the importance and need for asthma education in the areas of medication adherence and averting triggers.
REFERENCES


U.S. Environmental Protection Agency. (2012). *President’s task force on environmental health risks and safety risks to children. Coordinated federal action plan to reduce racial and ethnic disparities*. Retrieved from www.epa.gov/childrenstaskforce


APPENDICES
APPENDIX A: HUMAN SUBJECTS APPROVAL
September 14, 2012

Helda Pinzon-Perez, Ph.D.
Professor
Department of Public Health

Dear Dr. Pinzon-Perez,

I am pleased to report the Department of Public Health, Committee on the Protection of Human Subjects, has approved the changes made to your research project proposal submitted by you and your graduate student Audrey Martinez titled, "An Assessment of Education Needs of Adult Caregivers of Children with Asthma in the City of Fresno." The project continues to be accepted with minimal risk. Should any research protocol in the study change, please be advised you will need to resubmit your application for further review.

I hope the project goes well.

Sincerely,

Greg Thatcher, MSPH, PHD
Chair, Committee for the Protection of Human Subjects
Department of Public Health
Central Valley Asthma Project
QUESTIONNAIRE
(CVAP-Q22)

Case #: __________

Referral Source: ____________________________________________________________

Name of CVAP staff/promotora(s): _____________________________________________

Parent/Caregiver Name:______________________  Phone Number: __________

Home Address: ____________________________

Caregiver occupation(s): ______________________ Language: __________________

Name of primary care physician: ____________________________________________

Patient Information

Name: ____________________________________________

Age: _______  Gender:  □ Male  □ Female  DOB: __________________________

Ethnicity:  □ White  □ Black or African American  □ Asian  □ Hispanic or Latino
              □ American Indian and Alaska Native  □ Other: __________________

Siblings have asthma? □ 1Yes  □ 2No  Parent(s) has asthma? □ 1Yes  □ 2No

School/District: __________________________________________________________

Teacher’s Name: __________________________________________________________

Activities (e.g. sports): ____________________________________________________

Grade Level: __________

Do you know what an asthma action plan is and how it works?  □ 1Yes  □ 2No
Do you have an asthma action plan? □ 1Yes □ 2No

**Medication Questions**

1. **Does your child have asthma medication?**
   □ 1Yes
   □ 2No
   *If yes, can you name and/or show me your child’s asthma medications (*list all medications*)?
   ____________________________________________
   *If yes, where do you get your child’s asthma medication (*e.g. doctor, pharmacy, ER*)?
   ____________________________________________

2. **Has your child ever had to share their inhaler or someone else’s inhaler?**
   □ 1Yes
   □ 2No
   *If yes, how often and with whom does your child share their asthma medication?
   ____________________________________________

3. **Do you know when your child should use a quick relief inhaler** *(refer to name of medication - *e.g. albuterol* - if previously identified by parent)*?
   □ 1Yes
   □ 2No
   *How often does your child take this medicine? _____________________________

4. **Do you know when your child should use a controller medicine** *(refer to name of medication - *e.g. Advair* - if previously identified by parent)*?
   □ 1Yes
   □ 2No
   *How often does your child take medicine to prevent asthma symptoms? __________
**Trigger Questions**

5. Have you noticed anything that seems to make your child’s asthma worse?

   □ 1 Yes
   □ 2 No

*If yes, what things seem to make child’s asthma worse (e.g. bad air, cold weather, runny nose)? ________________________________

6. Does your child have allergies?

   □ 1 Yes
   □ 2 No

*If yes, what types of allergies (e.g. pollen, foods, pet dander)?

   ______________________________________________________________________________________

7. Have you noticed anything in your home that makes your child’s asthma worse?

   □ 1 Yes
   □ 2 No

*If yes, what things in the home seem to make child’s asthma worse?

   ______________________________________________________________________________________

8. Which of the following do you think are possible asthma triggers in your home?

   ***Check all that apply***

   □ Cockroaches   □ Candles   □ Dust   □ Air fresheners   □ Cigarette smoke
   □ Fans/AC   □ Carpets   □ Pets   □ Space heaters   □ Household cleaners
   □ Fireplace   □ Fish tank   □ Mold   □ Draperies   □ Stuffed animals

9. Can you do anything to reduce these potential triggers in your home?

   □ 1 Yes
   □ 2 No

* If yes, what can you do (have you done) to reduce these possible asthma triggers?

   ______________________________________________________________________________________
**Primary Care Questions**

10. Have you taken your child to see a primary care physician in the last 12 months?
   
   □ 1 Yes  If yes, was it specifically for their asthma? _______________________
   
   □ 2 No  If no, where do you take your child for asthma problems? __________

11. Have you and your child ever seen an Asthma Educator to learn more about asthma?
   
   □ 1 Yes  If yes, where did you see the Asthma Educator? ________________
   
   □ 2 No  If no, would you be interested in learning more about asthma? __________

12. Does your child have health insurance?
   
   □ 1 Yes  If yes, name of insurance: _____________________________________
   
   □ 2 No  If no, where do you take your child for asthma problems? __________

13. Does your health insurance pay for your child’s asthma medication?
   
   □ 1 Yes  If yes, what is your co-pay? _________________________________
   
   □ 2 No  If no, how much does the medicine cost you? _________________

   * Would you like to sign up for health insurance? ____________________________

**Asthma Impairment Questions**

14. Does your child wake up at night more than *two times* a month because of their asthma?
   
   □ 1 Yes  
   
   □ 2 No

   * If yes, what have you done to try to control your child’s asthma at night?

15. Does your child miss school because of their asthma (*e.g. trouble breathing or too tired*)?
   
   □ 1 Yes  
   
   □ 2 No
16. Does your child avoid participating in physical activities because of their asthma?
   □ 1 Yes
   □ 2 No

   *If yes, what is the main reason your child skips physical activities or sports (e.g. fear, tired)?

17. Does having asthma make your child feel different from their friends?
   □ 1 Yes
   □ 2 No

   *If yes, what is your child’s biggest issue or complaint about having asthma?

18. Does your child express or demonstrate additional stress because asthma?
   □ 1 Yes
   □ 2 No

   *If yes, what are some words that describe your child’s feelings about having asthma?

**Additional School Questions**

19. Does your child have an Asthma Action Plan on file at their school?
   □ 1 Yes
   □ 2 No

   * If no, do you know what an Asthma Action Plan is?

20. Does your child carry their rescue inhaler with them while at school?
21. Are you or your child aware of possible asthma triggers in their classroom?

☐ 1 Yes
☐ 2 No

*If yes, what are they and have you spoken to their teacher about removing them?
________________________________________________________________________

22. Does the school make special arrangements for your child to exercise indoors when outdoor air quality is bad?

☐ 1 Yes
☐ 2 No

*If yes, do you know what level (e.g. Red or Orange Flag) they keep him/her indoors?
________________________________________________________________________

*If yes, do you know if your child’s school participates in the RAAN program?
________________________________________________________________________
APPENDIX C: PERMISSION TO USE SECONDARY DATA
To Whom It May Concern;

Recently, within the last several months, we have been approached by Audrey Martinez to obtain data from our Central Valley Asthma Project (CVAP) for her MPH final thesis, at Fresno State. After careful review of her hypothesis, procedures and past conduct we, as well as the coordinators of this project out of the Madera County Public Health Department, have agreed to give Ms. Martinez the necessary data she requires to complete this project. However, our participation requires that we provide this information as secondary data as to protect the identity and privacy of those individuals in which we serve in both Fresno and Madera Counties.

The Central California Asthma Collaborative (CCAC) prides itself on our high moral conduct and policies, is to ensure the autonomy of our participants and the integrity of our organization. All individuals related to this project, including Ms. Martinez, are required to abide by HIPAA standards and must participate in a two week training program that extensively covers and reviews Ethic Law as it pertains to CVAP. Additionally, those who choose to conduct the assessment portion of CVAP must first pass a thorough background check making it so that the project is conducted in the safest possible manner.

We are excited to be working with Ms. Martinez on this project. We are confident in her abilities to abide by our protocol and are sure that she will produce something that we will all be proud of.

If there are any additional questions or further need for correspondence please contact me at arhat.hanifi@centralcalasthma.org or call me directly at the number below. Thank you so much.

Sincerely,

Arhat Hanifi
CVAP Coordinator/Assistant director of Programs, CCAC

Central California Asthma Collaborative
2491 Alluvial Ave | Clovis CA 93611
Office: (559) 272-4874 | Fax: (559) 473-4881
California State University, Fresno

Non-Exclusive Distribution License
(to make your thesis/dissertation available electronically via the library’s eCollections database)

By submitting this license, you (the author or copyright holder) grant to CSU, Fresno Digital Scholar the non-exclusive right to reproduce, translate (as defined in the next paragraph), and/or distribute your submission (including the abstract) worldwide in print and electronic format and in any medium, including but not limited to audio or video.

You agree that CSU, Fresno may, without changing the content, translate the submission to any medium or format for the purpose of preservation.

You also agree that the submission is your original work, and that you have the right to grant the rights contained in this license. You also represent that your submission does not, to the best of your knowledge, infringe upon anyone’s copyright.

If the submission reproduces material for which you do not hold copyright and that would not be considered fair use outside the copyright law, you represent that you have obtained the unrestricted permission of the copyright owner to grant CSU, Fresno the rights required by this license, and that such third-party material is clearly identified and acknowledged within the text or content of the submission.

If the submission is based upon work that has been sponsored or supported by an agency or organization other than California State University, Fresno, you represent that you have fulfilled any right of review or other obligations required by such contract or agreement.

California State University, Fresno will clearly identify your name as the author or owner of the submission and will not make any alteration, other than as allowed by this license, to your submission. **By typing your name and date in the fields below, you indicate your agreement to the terms of this distribution license.**

<table>
<thead>
<tr>
<th>Audrey Jo Martinez</th>
</tr>
</thead>
</table>

Type full name as it appears on submission

<table>
<thead>
<tr>
<th>October 25, 2012</th>
</tr>
</thead>
</table>

Date