

LIVING WITH AND LEARNING ABOUT ASTHMA ON THE COLLEGE CAMPUS

by

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A dissertation submitted to the Graduate Council of
Texas State University in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
with a Major in Adult, Professional, and Community Education
August 2019

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DEDICATION

I dedicate the writing of this dissertation to the most Holy Trinity: Father, Son, and Holy Spirit. My Father in heaven you have allowed me the opportunity to complete this work by your amazing grace. Jesus, savior of the world; in you I live, and move, and have my being; apart from you I can do nothing. The Holy Spirit was nothing short of the inspiration for this work. To Mary, the Mother of God; the one that leads me to Jesus. And, to the men and women doctors of the Catholic Church whose spiritual writings and personal holiness inspired me to complete this work, namely, St. Augustine, St. John Chrysostom, St. Anthony of Padua, St. Bonaventure, St. Thomas Aquinas, St. Catherine of Siena, St. Teresa of Avila, St. Peter Canisius, St. John of the Cross, St. Robert Bellarmine, St. Francis de Sales, St. Alphonsus Liguori, and St. Therese of Lisieux.

To my beautiful spouse Martha and our four children; Cody, Maricela, Cade, and Caleb. You are all blessings from God, and I realize y'all have made tremendous sacrifices as I spent countless hours away from home while I worked to complete this dissertation. I despise the times I had to miss even one of your activities from Cody's band performances, to Cade's or Caleb's soccer games, and Maricela's solo Psalm response at mass on Sunday or ukulele and singing performances at youth group. Even though I am the family member who is earning a PhD in Education, Martha you are the real educator of our family. Martha you are my inspiration as you are the one who keeps our family grounded in our Catholic faith. And, you have kept our family's spirit nourished by your singing, laughing, dancing, and storytelling. And to my earthly father,

James Paul Collins, thank you for your years of support in my pursuit of higher education. You have supported me from the beginning of my college education at the community college and ending with this PhD degree. And lastly, to my son Cade, the only family member with an asthma diagnosis. I remember the day you were diagnosed with asthma at age 3 ½ years and now you are a thriving teenager fearlessly competing on the soccer field. You are my personal inspiration as I strive to find ways to help others like you who will one day be counted among the thousands of students in the U.S. who are challenged by living with asthma on a college campus.

ACKNOWLEDGEMENTS

I would like to offer my sincerest gratitude to my dissertation chair, Dr. Joellen Coryell. Since the day I interviewed with you for entrance into this PhD program I knew there was potential we would work well together in conducting research. Thank you for always challenging me to go the extra step, and then some, to extract the in-depth meaning of my qualitative research data. And, your patience was beyond amazing in working with me on this dissertation journey. I would also like to offer my sincere thanks to my other committee members who offered suggestions and edits to this dissertation. Dr. Jovita Ross-Gordon, I grew fond of your calm demeanor and reassuring presence in the classroom and your body of work in adult education is inspiring. I wish you all the best as you move on to the next chapter in your life. Dr. Robert Reardon, I have enjoyed our conversations about your days working in emergency medicine. And, thank you (and your wife) for hosting the “doctoral writing days” at your home; it was a fun and relaxing time meeting new friends and enjoying good food. And, I would like to thank Dr. Chris Russian my fellow colleague in respiratory care, research mentor, and good friend. We have had some great times educating students through the years, presenting research at the AARC respiratory conferences, and collaborating to uncover the next groundbreaking research project. I truly appreciate your feedback on this dissertation and all the years of reviewing my research articles before they were sent out for peer-review.

A special thank you to the medical director at the student health center who agreed to let me conduct my research and gain permission to recruit the healthcare

providers from among his employees for this study. I look forward to working with you and your staff at the student health center to improve asthma care to students on campus. And, to the five asthmatic student participants and the five healthcare provider participants employed at the student health center who agreed to be interviewed for this research. I thank each of you for your time and for letting me share your “asthma journey” with you. It is my hope that this research project will aid other students with asthma around the country and aid the healthcare providers who work in college health to provide optimal asthma education and management to the students who seek out their help for better breathing with asthma.

I would like to thank all the staff at the Round Rock campus library including Anthony, Alan, Josh, Wendy, and Lynn whose assistance in locating resources, printing documents, organizing my references, and offering a listening ear was much appreciated. To my family, Martha, Cody, Maricela, Cade, and Caleb, I thank you all for your support in my PhD journey from the first day of class to graduation day. Without your prayers and loving support, I could not have endured this arduous dissertation journey.

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LIST OF ABBREVIATIONS

Abbreviation	Description
ACHA	American College Health Association
ACT	Asthma Control Test
AE-C	Certified Asthma Educator
CDC	Centers for Disease Control and Prevention
EMR	Electronic Medical Record
GINA	Global Initiative for Asthma
HCP	Healthcare Provider or Provider
MDI	Metered Dose Inhaler
MD	Doctor of Medicine
NAEPP	National Asthma Education and Prevention Program
NP	Nurse Practitioner
NIOSH	National Institute of Occupational Safety Health
DO	Doctor of Osteopathy
RN	Registered Nurse
RPFT	Registered Pulmonary Function Technician
RRT	Registered Respiratory Therapist
SHC	Student Health Center

ABSTRACT

In 2016, the American College Health Association (ACHA) reported that 8.9% of college students indicated having an asthma diagnosis. Previous studies have shown that college students' quality of life is diminished by asthma symptoms which affect their self-esteem and academic performance. When asthmatic students transition to a college campus, they may be ill-equipped to self-manage their asthma due to a lack of proper education, misinformation from their primary care physician, or lack of acceptance of the chronic nature of their disease. In addition, students with a chronic illness often struggle with competence in self-management, confidence in self-advocacy, and the transition to adult health care. The main purpose of this qualitative instrumental case study was to gain insight into how college students with asthma learn from their experiences to self-manage their asthma and the strategies they utilize to cope with asthma on the college campus. In addition, the study's purpose was to gain knowledge about the perceptions and attitudes of the healthcare providers, employed at the student health center of a large public university in the southwest region of the United States, regarding the current state of asthma management on the campus.

Results of this study indicate students with asthma are learning from their lived experiences with asthma on the college campus. However, they desire to learn more about their asthma including the science of what is happening in their lungs with asthma. There is a need for well-written asthma literature directed to the college students' academic mind-set and well-versed healthcare providers in the art of asthma education to aid the student in learning to better self-manage their asthma. In addition, this study reveals asthmatic students have acquired coping strategies from learned behaviors of living with asthma on a campus with extreme weather conditions, a hilly terrain, and many airborne allergens, all of which threaten to trigger their asthma. And, those students who are transitioning to an adult role have grown more independent from their parents regarding control of their asthma management and are becoming more autonomous with

healthcare decision-making.

Regarding the healthcare providers, this study revealed a truly committed group whose collective goal is to improve the health and well-being of students on campus, including those with asthma. Experiential learning was demonstrated by the healthcare providers with most of the actual learning about asthma treatment and management occurring through the daily experience of working with asthmatic students on campus. However, the healthcare providers recognize the following learning needs: (a) additional training in the performance and interpretation of lung function testing, (b) the appropriate incorporation of the national asthma guidelines in the design of asthma treatment plans, and (c) creation of a system in place to identify students on campus with asthma. Furthermore, the challenge of healthcare providers in providing optimal asthma care for students is influenced by time constraints, the exorbitant cost of asthma medications, and establishing a trusting relationship between the healthcare provider and the student/patient.

I. INTRODUCTION

I closed my eyes, took a deep breath, and tried to exhale. My heart was pounding in my chest, the vibrations crippling my body with exhaustion. "Stay calm," I told myself. When it comes to managing my asthma and allergies, I usually feel no anxiety. But when I experience an asthma flare, it ignites a fear that typically stays dormant. Every single breath is like my lungs are bench-pressing 150 pounds. When it continues for hours with only short spurts of relief from a quick-relief inhaler, my chest aches with each breath and my whole body feels weak and exhausted. During an asthma flare, I am keenly aware of how much work my lungs go through just to keep me alive. A scary, suffocating panic fogs my mind in these moments. From 2010 to 2016, my asthma was extremely well controlled. I didn't even think about it. I did not take any asthma medication in that time, other than my quick-relief inhaler before long runs as a preventive measure or the occasional times when I was around my friends' dogs or cats, which can trigger my asthma and environmental allergies. I even spent three years living in Italy, where I felt great. Then, last year, I spent two weeks living out of a hotel while work was done on my home. Before moving in, I asked the hotel manager for a pet-free room and was told that would not be a problem. The first night, my breathing was normal, but I woke up feeling tightness in my chest. I used my quick-relief inhaler and felt fine all day at work. Back at the hotel that night, I was fine but again I woke up in the morning with chest tightness. I decided to keep the windows open at night for fresh air, hoping that would help my nighttime breathing and my lungs, but symptoms worsened each day. I slept terribly each

night, waking up multiple times. My exhaustion grew, but I was still in denial about my symptoms. I continued to just use my quick-relief inhaler as treatment. Midway through my second week in the hotel, I woke up barely able to breathe. I had forgotten how scary it was; I hadn't felt that way in many years. In that moment of fear and frustration, tears rolled down my cheeks. I was at a loss. The next morning, I called my allergist. I finally admitted to myself my symptoms were past the point of just using a quick-relief inhaler. I needed medication to help bring my symptoms back to baseline. My allergist prescribed a mild inhaled corticosteroid to reduce inflammation; it helped me sleep better but my chest still felt like it was being squeezed. I called my allergist again a couple days later. He prescribed prednisone, a stronger oral corticosteroid. I was reluctant to take prednisone because in the past the drug's side effects made me edgy and restless, but this time I knew I had no choice. As I took prednisone, I monitored my breathing with a peak flow meter and soon I started to feel closer to my baseline. Even after leaving the hotel, it took about a month until I felt back to normal. Now a year after the asthma flare, I'm fully recovered with no extra medications needed. It's easy to forget how scary asthma can be when it's well controlled for years at a time. My takeaway: Even if your asthma is well controlled, it's important to recognize when you're experiencing symptoms and seek treatment immediately. I don't want my symptoms to ever get to a point where I need to go on an oral corticosteroid. In the future, if a similar flare occurs, my goal is to face any denial head-on and call my allergist immediately. Asthma can be frightening,

but with awareness, I know I can maintain it effectively and live and breathe exhaustion-free. (Bahn, 2017, p. 24-25)

This story relates the lived experience of an adult woman named Allie who survived an asthma flare-up and lived to tell about it. Allie's lived experience informs the reader that asthma is a chronic, intermittent, and unpredictable lung disease. I place emphasis on Allie surviving an asthma flare-up because there are more than 3,000 individuals that die from an asthma flare-up each year in the United States (Moorman, et al., 2007). There are documented cases of students dying on college campuses in the U.S. from asthma flare-ups due to insufficient management of this chronic disease. One such case is of Erin Ruchotzke, a college student who attended Northern Iowa University; she died from an asthma flare-up in 2007 (Baker, 2011). Erin was a known asthmatic; however, as reported by her mother in a newspaper article, she did not recognize that her symptoms during the week prior to her death were caused by asthma (Baker, 2011). Erin's inability to recognize that her symptoms were warning signs of an impending asthma flare-up and Allie's denial about her asthma symptoms and subsequent delay in seeking treatment are a witness to the truth about asthma; it is an unpredictable disease that can lay dormant for years only to return with a vengeance. The stories of Allie and Erin reveal the reality that a life-threatening asthma flare-up can occur on any given day in the life of an asthmatic. The Centers for Disease Control and Prevention (CDC) reports that boys are more likely to have asthma than girls, but women are more likely to have asthma than men (Centers for Disease Control and Prevention, 2017). The CDC has also reported that adults are nearly four times more likely than children to die from asthma (CDC, 2017). Asthma may lie in remission for years, as revealed by Allie's lived

experience, and then return when the individual is exposed to an asthma trigger, such as pet dander or grass pollen, that initiates the asthma flare-up. Erin experienced warning signs of an impending severe asthma episode; however, as mentioned in her story, she did not recognize that her symptoms during the week prior to her death were caused by asthma. The truth is asthma is a debilitating chronic disease, which may be life-threatening, for which there is no cure (National Institute of Health [NIH], 2014).

Statement of the Problem

In 2016, the American College Health Association (ACHA) reported that 8.9% of college students indicated having an asthma diagnosis. Previous studies have shown that college students' quality of life is diminished by asthma symptoms which affect their self-esteem and academic performance (ACHA, 2016). The CDC has reported that the asthma death rate is higher among people 18 or older (CDC, 2017). During an asthma flare-up, a person may experience shortness of breath, chest tightness, wheezing, and coughing, especially at night resulting in sleep deprivation (Reece, Holcroft, Faul, Quattrocchi, & Nicolosi, 2002). If we were to apply the national average of 8.9% to the student enrollment at some of the large public colleges and universities in the U.S., it would confirm the magnitude of the crisis on college campuses.

Carpentier, Mullins, and Van Pelt (2007) describe the nature of asthma as intermittent, unpredictable, and disruptive to the individual with asthma. The term illness uncertainty used by psychologists, is defined by Carpentier et al. (2007) as, "the inability of an individual with a chronic illness to determine the meaning of an illness related event", may be experienced by asthmatics and may lead to "the avoidance of situations or activities that they may perceive to trigger an asthma episode" (p. 120). When asthmatic

students transition to a college campus, they may be ill-equipped to self-manage their asthma due to a lack of proper education, misinformation from their primary care physician, or lack of acceptance of the chronic nature of their disease (Lemly, Lawlor, Scherer, Keleman, & Weitzmann, 2014). These studies reveal the gravity of the situation faced by students with asthma on college campuses. In an editorial Levy (2015) explained, “The primary concern may be a lack of attention on asthma management regarding the transition to adulthood” (p. 1211). Levy also noted, “Most of the focus on asthma management is targeted for children and adolescents resulting in insufficient asthma management of college students thereby creating a vulnerable population” (Levy, 2015, p. 1211). In addition, students with a chronic illness often struggle with competence in self-management, confidence in self-advocacy, and the transition to adult health care (Maslow et al., 2013). Furthermore, Baumgartner (2011) asserts that students may experience barriers in learning about their chronic illness; they need to learn about symptoms and therapies, the disease process, and how to access and evaluate health information.

Conducting research to investigate this crisis on U.S. college campuses is paramount. Research is needed to add to the body of knowledge for the medical profession, especially for the healthcare providers (HCPs) working in college health. And, to create awareness on college campuses of this chronic, sometimes fatal disease. A qualitative case study was conducted to gain the perspective and viewpoint of students with asthma thereby giving them a voice in helping to provide solutions to the problem. Also, this study was designed to obtain the perspectives of the HCPs working at the student health center (SHC) on campus. Gaining perspectives from college students with

asthma and campus HCPs intrigues me on a professional level as a certified asthma educator and on a personal level as the father of a teenage son with asthma. Furthermore, as an associate professor of respiratory care and a researcher, I am interested in understanding how students with asthma learn from their experiences in self-managing their asthma during their college years. The questions guiding my research are as follows: (1) How do undergraduate and graduate students with asthma learn from their experiences in the self-management of their asthma during their college years?, (2) How do these students cope with their asthma on the college campus?, and, (3) How do healthcare providers at the SHC on campus perceive the current state of education and management of asthma for college students with this chronic disease?

Purpose of the Study

The main purpose of this case study was to gain insight into how college students with asthma learn from their experiences to self-manage their asthma and the strategies they utilize to cope with asthma on the college campus. In addition, this study's purpose was to gain knowledge about the perceptions and attitudes of the HCPs employed at the SHC of a large public university located in the southwest region of the United States, regarding the current state of education and management of asthma on the campus. Asthmatic students on a college campus may be ill-equipped to self-manage their asthma due to a lack of proper education, misinformation from their primary care physician, or lack of acceptance of the chronicity of their disease (Lemly et al., 2014). In addition, college students may experience various challenges and barriers to learning about their chronic illness (Baumgartner, 2011).

Engaging students with asthma and the HCPs at the SHC through a qualitative

case study aided in gaining a new perspective and knowledge regarding students living with asthma and the daily management of their chronic disease on the college campus. This study also created awareness and knowledge of the challenges asthmatic students face living with a chronic disease during their college years. Furthermore, the insights and knowledge gained from this case study may enlighten adult HCPs and students with asthma in the care and treatment of asthma. It was my hope as a researcher and an asthma educator this study reveal some practical solutions for the SHC providers in providing education and management of asthma for college students with this chronic lung disease.

Overview of Methodology

The following is a brief overview of the methodology and theoretical framework for this case study. A full explication of the methodology will be presented in Chapter III. This is a qualitative study utilizing an instrumental case study approach which addressed the issues and problems of college students learning about and living with asthma on the college campus. A case study is defined as, “an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident” (Yin, 2014, p. 16). The case study research method is used to contribute to the researcher’s and the reader’s knowledge of individual, group, organizational, social, political, and related phenomena (Yin, 2014). The recommended approach to starting a case study involves a thorough literature review followed by the development of appropriate research questions (Yin, 2014). According to Yin (2014), “the more the researcher’s questions seek to explain some present circumstance (“how” or “why” some social phenomenon works), the more that case study research will be relevant” (p.4). Many fields have made use of

case study research to aid in gaining knowledge of individuals, groups, organizations, social, political, and related phenomena. As mentioned in the introduction, the questions guiding my research were: (1) How do undergraduate and graduate students with asthma learn from their experiences in the self-management of their asthma during their college years?, (2) How do these students cope with their asthma on the college campus?, and, (3) How do healthcare providers employed at the SHC on campus perceive the current state of education and management of asthma for college students with this chronic disease?

The unit of analysis for this single case study is an organization; a large public university located in the southwest region of the United States. The units of observation consisted of college students with asthma and the healthcare providers and the SHC documentation/processes. The phenomena of this case study are the learning experiences of college students with asthma amid the challenges and barriers to self-manage their asthma during their college years and the perceptions of the HCPs on campus and their learning experiences about asthma management. The context is a large public university located in the southwest region of the United States with an extensive SHC, fully staffed with HCPs consisting of physicians and nurse practitioners.

This study consisted of two groups of participants, college students with partially controlled asthma and the HCPs (i.e., physicians and nurse practitioners) employed at the SHC on campus. Data collection for this case study included in-depth, semi-structured, individual face-to-face interviews of the students and healthcare providers, document collecting (i.e., campus-disseminated asthma education literature, SHC asthma history forms, and asthma control test forms), separate focus group sessions, with the HCPs and

college students, and a researcher's journal to record notes taken during the interviews and focus groups and for notes documenting the research site environment.

All data collected for this case study underwent qualitative coding as proposed by Charmaz (2006). The coding process consisted of three steps: (1) initial coding, (2) focused coding, and (3) axial coding (Charmaz, 2006). Once the codes emerged, they were assembled into categories and the data was subjected to the constant comparative method of data analysis developed by Glaser and Strauss (1967). After coding and constant comparative analyses was completed, a final analysis was conducted to identify instances of experiencing, reflecting, thinking, and acting in participants' learning processes. As I progressed through data analysis and viewed this case study through the lens of experiential learning theory (ELT), I hoped to discover if college students did in fact learn from their experiences living with asthma on a college campus. Also, I was interested in discovering what the healthcare providers on campus have learned through their experience of treating and caring for students with asthma.

This case study has its roots in ELT from the perspective of David A. Kolb (2015). ELT emphasizes that learning is a process whereby knowledge is created through transformation of experience (Kolb, 2015). Some of the critical aspects of ELT includes an emphasis on the process of adaptation and learning as opposed to content or outcomes and knowledge as a transformation process (Kolb, 2015). If asthmatic students are to learn how to self-manage their asthma, then according to ELT, students will gain knowledge from a combination of grasping and transformation of experience. For example, Allie, whose story was told in the introduction, shares her grasping and transformation of experience when she states, "Even if your asthma is well controlled,

it's important to recognize when you're experiencing symptoms and seek treatment immediately" (Bahn, 2017, p. 25). Kolb (2015) states, "Grasping experience refers to the process of taking in information, and transforming experience is how individuals interpret and act on that information" (p. 51). Allie's grasping experience is the recognition of her asthma symptoms and her transformation of experience is seeking treatment immediately. Learning how students with asthma cope with their new environment on the college campus may affect how they learn to take in information, interpret it and act on that information concerning the self-management of their asthma. ELT provides insight into the process of how adults learn about their asthma; learning is interrelated to how an individual creates knowledge (Kolb, 2015). Kolb proclaims that the individual's perception of experience is not sufficient for learning; "it must include organization and transformation of the experiences, which involves interpretation of the experience followed by action that creates reliable knowledge" (p. 155).

Kolb's (2015) experiential learning cycle consists of two dialectically related modes of grasping experience – Concrete Experience and Abstract Conceptualization – and two dialectically related modes of transforming experience – Reflective Observation and Active Experimentation. This learning cycle, "is an idealized process whereby the learner integrates each of the four modes: experiencing, reflecting, thinking, and acting in a repetitive process that is sensitive to the learning situation and what is being learned" (p. 51). By utilizing ELT as the framework for this case study, it was my hope that new knowledge was created concerning how students experience, live with, and learn about asthma on the college campus.

Researcher's Background

For the last ten years I have worked as a respiratory care (RC) educator teaching in an RC educational program at a large public university in the southwest region of the United States. In my role as an RC educator I have had the pleasure of teaching junior and senior respiratory care students the most up to date research regarding asthma education and management. In addition, I am an active member of the Association of Asthma Educators (AAE); this national organization's mission is, "to be the premier provider of evidence-based asthma education and to advocate for patients with asthma and their families" (Association of Asthma Educators, 2018). I attend the AAE annual meeting each year to keep up-to-date with the latest research and practice of education and management of asthma. On a personal level, I am the father of an asthmatic teenage son. My son was diagnosed with asthma at three years of age. He is now a thriving fifteen-year-old who plays in a competitive soccer league. His asthma is in control and is managed by a board-certified Allergist. Although my son has not experienced an asthma flare-up over the last 12 months, he knows of the importance of using his maintenance medication daily and the need for ongoing monitoring of his asthma.

I also bring my professional experience within the context of this case study. I have been a registered respiratory therapist since 1996, a registered pulmonary function technologist since 1997, and a certified asthma educator since 2005. My work experience includes more than 20 years in the acute care hospital, including the emergency department, adult intensive care unit, pulmonary function laboratory, and pulmonary rehabilitation caring for individuals with asthma, emphysema, chronic bronchitis, pulmonary fibrosis, cystic fibrosis, and other chronic lung diseases. In my role as a

respiratory care educator, I have taught RC courses in pulmonary function testing, pulmonary rehabilitation, respiratory care clinical practice, and the emergency care of adults and children with lung disease. The RC students that I teach have been a source of motivation for me to conduct research on the topic of asthma on the college campus. In my tenure as an educator, several RC students enrolled in my courses have revealed to me that they have an asthma diagnosis. Over the years these students have presented me with some of the challenges they have experienced in self-managing their asthma during their college years. For example, one student stated that she had been using her quick relief asthma metered dose inhaler (MDI) incorrectly since she was diagnosed at 10 years of age. It was not until this student was 21 years of age, and in the first semester of an RC educational program, that she learned from an RC faculty member how to properly use her asthma inhaler device. This experience and others with students with an asthma diagnosis led me to investigate this problem of asthma on the college campus through a pilot research study which was titled, "Managing asthma on the college campus: Findings of a Texas pilot study" (Collins, Weiss, & Henry, 2015). The results of this descriptive pilot study revealed that medical directors of student health centers in Texas experienced challenges in meeting the needs of the student population with asthma on their campuses. The medical directors interviewed via telephone in the study revealed that some of the challenges and/or barriers of college students with asthma included the following: lack of awareness of student health center services, lack of confidence in the student health center services, lack of health insurance, inaccurate diagnosis, and students' lack of understanding of chronic disease management (Collins, et al., 2015). With all this said, I recognize that I must be vigilant when conducting this study to be self-aware of my

biases as an asthma educator/respiratory therapist and the father of an asthmatic son. It is my hope the findings of this case study may give some insight into how to effectively address the issues of education and management of asthma on the college campus.

Terms and Definitions

The terms relevant to this study are defined as follows:

1. *Allergist*. An allergist / immunologist (commonly referred to as an allergist) is a physician specially trained to diagnose, treat and manage allergies, asthma and immunologic disorders including primary immunodeficiency disorders (American Academy of Allergy, Asthma, and Immunology, 2017).
2. *American College Health Association (ACHA)*. A national organization dedicated to the health needs of students at colleges and universities in the United States. It is the principal leadership organization for advancing the health of college students and campus communities through advocacy, education, and research (American College Health Association, 2016).
3. *Asthma*. A common and potentially serious chronic disease that can be effectively treated to control symptoms and minimize the risk of flare-ups. It is usually characterized by chronic inflammation of the lungs (GINA, 2017).
4. *Asthma Action Plan*. A written document developed between the patient and medical provider which shows patients how to make short-term changes to treatment in response to changes to their symptoms and/or peak expiratory flow, as well as, how and when to access medical care (GINA, 2018).
5. *Asthma Control Test (ACT)*. A numerical asthma symptom control tool that provides scores and cut points to distinguish different levels of symptom control for adults and

- children (GINA, 2017).
6. *Asthma flare-up*. A worsening of symptoms and lung function from the patient's usual status. An asthma flare-up may be characterized by symptoms such as wheezing, shortness of breath, chest tightness and cough that vary over time in their occurrence, frequency and intensity. The terms 'episodes', 'attacks', or 'exacerbations' are also often used, but they have variable meanings. The term 'flare-up' is preferred for use in discussions with patients (GINA, 2017).
 7. *Centers for Disease Control and Prevention (CDC)*. The leading national public health institute of the United States. The CDC is a U.S. federal agency under the Department of Health and Human Services, headquartered near Atlanta, Georgia. The organization works 24/7 to protect America from health, safety and security threats, both foreign and in the U.S. (CDC, 2017).
 8. *Certified Asthma Educator (AE-C)*. An expert in counseling individuals with asthma and their families how to manage their asthma and to minimize its impact on their quality of life (National Asthma Educator Certification Board, 2017).
 9. *Controlled Asthma*. Absence of daytime or nighttime symptoms, infrequent need for quick-relief medications (no more than twice a week), peak flow readings within normal range, and no limitations to daily activities indicating the goals of therapy are met (GINA, 2017).
 10. *Coping*. Coping refers to conscious, volitional efforts to regulate oneself and/or the environment in response to stress (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001).
 11. *Chronic Illness*. A chronic physical, developmental, behavioral, or emotional

- condition that requires more than routine health and related services (Lemly et al., 2014).
12. *Doctor of Osteopathy*. A physician who is trained to help each person achieve a high level of wellness by focusing on health promotion and disease prevention (American Association of Colleges of Osteopathic Medicine, 2019).
 13. *Doctor-Patient Relationship*. A relationship that is based on mutual participation of two individuals which is dependent on the medical situation and the social scene or the socio-political and intellectual-scientific climate at the time (Kaba & Sooriakumaran, 2007).
 14. *Electronic Medical Record (EMR)*. Digital versions of the paper charts in clinician offices, clinics, and hospitals. EMRs contain notes and information collected by and for the clinicians in that office, clinic, or hospital and are mostly used by providers for diagnosis and treatment (HealthIT.gov/faq).
 15. *Global Initiative for Asthma (GINA)*. An organization that works in collaboration with the National Heart, Lung, and Blood Institute, National Institutes of Health, USA, and the World Health Organization to aid health care professionals and public health officials around the world to reduce asthma prevalence, morbidity, and mortality (GINA, 2017).
 16. *Healthcare provider*. Defined as a Doctor of Medicine or osteopathy, podiatrist, dentist, chiropractor, clinical psychologist, optometrist, nurse practitioner, nurse-midwife, or a clinical social worker who is authorized to practice by the State and performing within the scope of their practice as defined by State law (University California Berkeley, 2017).

17. *Metered dose inhaler (MDI)*. An MDI is a small device that delivers a measured amount of medication to the lungs. The person using the device gets the medication with each spray (puff) when he/she breathes in (American Thoracic Society, 2014).
18. *National Asthma Education and Prevention Program (NAEPP)*. The NAEPP asthma guidelines were compiled by an expert panel to make recommendations to healthcare providers for managing asthma long term and for managing exacerbations (National Asthma Education and Prevention Program, 2007).
19. *Non-Traditional Student*. An adult student who is over the age of 24 who is characterized by having family and work responsibilities as well as other life circumstances that can interfere with successful completion of educational objectives (U.S. Department of Education, 2019).
20. *Nurse Practitioner (NP)*. A clinician that blends clinical expertise in diagnosing and treating health conditions with an added emphasis on disease prevention and health management. NPs work autonomously and in collaboration with a licensed physician to provide a full range of primary, acute and specialty health care services (American Association of Nurse Practitioners, 2017).
21. *Partially Controlled Asthma*. Daytime symptoms more than twice a week and sometimes at night, use of quick-relief medicine more than twice a week, peak flow rate less than 80% of normal, and asthma flare-ups that occur at least once a year but not weekly (GINA, 2017).
22. *Registered Respiratory Therapist (RRT)*. An individual who has graduated from an approved American Medical Association respiratory therapy educational program and has passed the two parts (i.e., written examination and clinical simulation

- examination) of the national board examination administered by the National Board for Respiratory Care (National Board for Respiratory Care, 2017).
23. *Self-Management*. The individual with asthma takes on the responsibility for self-managing their asthma care including self-administration of prescribed asthma medications, daily self-assessment, adhering to a healthcare provider created asthma action plan, and participation in ongoing monitoring of their disease (GINA, 2017).
24. *Triggers*. Agents that produce asthma symptoms which are immediate or by a delayed response depending on the individual's hypersensitivity to a particular agent. Common inhaled asthma triggers are allergens such as dust mites, pollens, pet dander; irritants such as tobacco smoke, wood fires, perfumes; respiratory illnesses such as the common cold or flu and strong emotions such as anger, crying, laughing (American Academy of Allergy, Asthma, and Immunology, 2017).
25. *University Health Center (UHC) or Student Health Center (SHC)*. University/College run primary care medical facility staffed by physicians and/or nurse practitioners or other healthcare providers with the goal of promoting, improving and advancing the health, well-being and overall success of college students. (American College Health Association, 2017).

Summary

This chapter began with an introduction which described the lived experiences of Allie, an adult asthmatic, who survived an asthma flare-up. Her breathing was challenged by worsening asthma symptoms triggered by pet dander in a hotel room she was occupying. Allie relates the lesson she learned in living with asthma, namely to “recognize when you’re experiencing symptoms and seek treatment immediately” (Bahn,

2017, p. 24). Also told in this chapter was the story of college student Erin Ruchotzke, who died from an asthma flare-up. In Erin's case, she did not recognize her asthma symptoms in time to seek life-saving treatment. The stories of Allie and Erin are evidence that adult asthmatics remain at risk for a life altering or life-threatening asthma flare-up which can turn fatal. The statement of the problem emphasizes that during the college years, students with asthma may be ill equipped to self-manage their asthma due to a lack of proper education or lack of acceptance of the chronicity of their disease (Lemly et al., 2014). To conclude Chapter I, the main purpose of this case study was to provide insight into how college students with asthma learn from their experiences during their college years to self-manage their asthma. In addition, the purpose was to gain knowledge about the perceptions of healthcare providers regarding the current state of education and management of asthma on the campus. In the next chapter, I will present the relevant literature as it pertains to the topic of education and management of asthma on the college campus.

II. RELEVANT LITERATURE

The constellation of challenges is real for the college student with a chronic illness as he/she navigates through the college years. The literature reveals most students with a chronic illness, such as asthma, are learning to cope with and self-manage physical symptoms, psychological and emotional distress, financial burdens, and the transition to college life. In addition, the CDC has reported that adults are nearly four times more likely than children to die from asthma (2017). This fact from the CDC suggests that adults with asthma may be vulnerable to a life-threatening asthma flare-up.

The American College Health Association-National College Health Assessment II of spring 2017 reports that 85.9% of college students described their health as good, very good or excellent (ACHA, 2017). However, a study by Unwin, Goodie, Reamy, and Quinlan (2013) reports that approximately 600,000 college students in the U.S. report having some type of disability or chronic illness. The ACHA (2017) report indicates that approximately 45% of college students have been diagnosed or treated by a professional for the following health problems within the last 12 months: asthma 8.6%, allergies 19.3%, and sinus infection 17.2% (ACHA, 2017). Allergies and sinus infection represent health issues affecting the upper airway (i.e., nasal passages) which can lead to breathing issues in the lower airways (i.e., lungs). Of all the health problems listed (except allergies and sinus infection) in the spring 2017 AHCA report only back pain (12.3%) and strep throat (11%) topped an asthma diagnosis (ACHA, 2017). Individuals with a chronic illness are defined as, “those who have a chronic physical, developmental, behavioral, or emotional condition and who also require more than routine health and related services” (Lemly et al., 2014, p. 886). Individuals with an asthma diagnosis are categorized as

having a chronic illness, which may flare-up intermittently at times, and requires more than routine health services to keep under control.

In a report dated February 2017, the U.S. Department of Education, National Center for Education Statistics published enrollment numbers of college students; this report revealed there are approximately 20 million college students enrolled in institutions of higher education in the U.S. In addition, the National Center for Education Statistics (2004-2014) reveal student enrollment in institutions of higher education increased 17% from 17.3 million to 20.2 million. And for fall 2017, the same report estimated 20.4 million students to be enrolled in institutions of higher education in the U.S. In 2014, the National Center for Education Statistics reported there were more female students (56%) than male students enrolled in colleges and universities in the U.S. Furthermore, this government report stated that the number of older students (age 26 and over) will increase in the coming years when compared to traditional age students, 18 to 25 years of age. From 2014 to 2025, the National Center for Education Statistics projects the increase for students under age 25 to be 13%, compared with 18% for students age 26 and over. These increasing student enrollment numbers in the U.S. are a source of additional burden on SHCs on college campuses and will challenge their capacity to deliver high quality healthcare including the education and management of students with asthma.

In a study by Lemly et al. (2014) the investigators surveyed 153 medical directors at institutions of higher education and found that 42% had no system to identify incoming students with a chronic illness. In addition, institutions of higher education in the U.S. face increasing public pressure to provide quality services to their students, including

quality health care (Fullerton, 2011). The lack of a system to identify students with a chronic illness leaves these students vulnerable and at risk for poor academic performance, decreased quality of life, and lower graduation rates (Lemly et al., 2014). However, Houman and Stapley (2013) report that some students with a chronic illness or disability may not want to be identified. Students with a chronic illness may view attending college as “the beginning of a new life and hope to leave behind any stigma associated with atypical situations” (Houman & Stapley, 2013, p. 62). It is my hope that this dissertation research will shed light on the challenges of students living with asthma as well as the challenges of the SHC healthcare providers in caring for and treating students with asthma on the college campus.

The search for literature was conducted via the university library online search system, online research databases, and Google Scholar. After an extensive online search, and with the help of a university research librarian, I identified just two doctoral dissertations that directly addressed asthma on the college campus. Firstly, Debra Weiss, Ed.D. completed a dissertation in 2010 at Columbia University, Teachers College, School of Education and, secondly a dissertation was completed by Hedian Swanson, doctor of nurse practice (DNP) in 2012 at University of Nevada, Las Vegas, School of Nursing. Neither of these dissertations engaged students in the research process resulting in the lack of student insights and perspectives of living with asthma on a college campus. These two dissertations focused solely on the student health center medical directors and the clinical staff (i.e., physicians, nurses, nurse practitioners, physician assistants) employed at the SHC facility on campus. My proposed research gathered qualitative data via face-to-face interviews and focus group interviews with college students and the

healthcare providers employed at the student health center. In addition, other sources of data included field notes and document review. The literature references are postdated 1967 with the most recent being articles published in 2019. This review includes information from many from sources that include books, peer-reviewed journal articles, doctoral dissertations, national practice guidelines, government reports, and government agencies.

The Nature of Asthma

Asthma is the most common chronic illness in the United States; in 2010 18.7 million adults had asthma (1 in 12 adults) and 7 million children (1 in 11 children) (Akinbami, et al., 2012). It may be characterized as “chronic, relapsing, and remitting courses, creating a myriad of challenges among affected individuals” (Molzon et al., 2013, p. 484). Research reveals that 8.9% of college students have been diagnosed by a healthcare professional with asthma (ACHA, 2016). Asthma is a chronic inflammatory disease of the airways of the lungs. Airway inflammation of the lungs contributes to airway hyperresponsiveness, airflow limitation, respiratory symptoms, and disease chronicity (NAEPP, 2007). Symptoms of asthma include wheezing, shortness of breath, chest tightness, and coughing (Akinbami, et al., 2012). Improper management of asthma contributes to partially controlled symptoms resulting in a reduction in exercise, social, and school related activities leading to decreased health related quality of life (Molzon et al., 2013). In addition, in one study of 487 participants, 79% of which were female, data from this large multi-center randomized double masked controlled trial revealed that most adults with asthma reported some form of sleep disturbance including daytime sleepiness resulting in a decreased quality of life (Mastrorarde, Wise, Shade, Olopade, &

Scharf, 2008). In adults with asthma, poor sleep quality combined with partially controlled asthma resulted in increased daytime sleepiness and decreased quality of life (Molzon et al., 2013).

The goals of asthma management are to control symptoms and prevent flare-ups to allow individuals with asthma to function adequately in the performance of their day to day activities (NAEPP, 2007). To aid in meeting these goals and to implement effective asthma management, the Global Initiative for Asthma (GINA) 2017 guidelines recommend establishing a partnership between the person with asthma and the health care provider (GINA, 2017). Establishing a partnership between students with asthma on the college campus and the healthcare providers at the SHC is a challenge. One of the greatest challenges in building a partnership with students with asthma is getting the student to understand the importance of returning to the SHC for follow up appointments to monitor their asthma and manage medications (SHC medical director, personal communication, January 30, 2018). There is emerging evidence that establishing a shared-partnership will improve outcomes (GINA, 2017). These data from GINA and NAEPP inform the research of the education and management of asthma by establishing evidence-based guidelines for the care and treatment of adults with asthma.

Asthma experts comprising the NAEPP committee recognize that teaching adults with asthma to self-manage their condition is conducive to reducing urgent care visits to the emergency department or doctor's office and reduced hospitalizations (NAEPP, 2007). The ultimate goal of asthma management is to "promote patient self-management to reduce the impact of asthma on related morbidity, functional ability, and quality of life" (NAEPP, 2007, p. 96). However, as students with asthma transition to college many

are found to have a deficit in the knowledge of how to self-manage their asthma (Unwin et al., 2013). Also, the CDC has reported that adults are four times more likely to die from an asthma flare-up when compared to children, (CDC, 2017). So, whether a student with asthma is transitioning to college from high school or they are an established older student with asthma on campus, the literature reveals evidence that both groups remain at risk for asthma flare-ups. Furthermore, the transition of young adults with asthma to college goes largely unaddressed which makes them a vulnerable population, placing them at risk for poor academic performance, increased risk taking, depression, and decreased quality of life (Levy, 2015). In addition, college students with moderate to severe asthma are more at risk of developing psychiatric problems including increased stress, anxiety, and depression (Reece et al., 2002). These studies reveal the nature of asthma which affects more than breathing and the lungs; there are extrapulmonary complications (i.e., outside of the lungs), compounding the barriers and challenges of providing college health services and adequately managing asthma. As evidenced by the data presented here, asthma research is informed by the pulmonary complications (i.e., wheezing, coughing, shortness of breath) and extrapulmonary complications affecting college students with asthma including anxiety and depression, stress, sleep disturbances, increased risk taking, decreased activity levels, and decreased quality of life. This section on the nature of asthma informs this dissertation research by the following evidence:

- Improper management of asthma contributes to partially controlled symptoms including wheezing, shortness of breath, coughing, and sleep disturbances (Molzon et al., 2013).

- The ultimate goal of asthma management is to promote patient self-management to reduce the impact of asthma on related morbidity, functional ability, and quality of life (NAEPP, 2007).
- The transition of young adults with asthma to college goes largely unaddressed which makes them a vulnerable population (Levy, 2015); and,
- Extrapulmonary complications affecting college students with asthma include anxiety and depression, stress, sleep disturbances, increased risk taking, decreased activity levels, and decreased quality of life (Reece, 2002).

University Health Centers and Healthcare Providers

In an article by Fullerton (2011) titled, “A Collaborative Approach to College and University Student Health and Wellness,” he articulates several pertinent points regarding health care on the college campus. He begins by making note of how institutions of higher education in the U.S. face increasing public pressure to provide quality services to their students, including quality health care. From an historical perspective he notes that the traditional university health center has not been held in high esteem, and a visit to the facility was avoided unless a student was ill or injured. Furthermore, he comments that today there is a push for university health centers to establish a relationship with community partners to supplement services and programs provided to their students; many universities in the U.S. have established collaborative services between the university health center and the student recreation center. This endeavor puts the focus on student preventative fitness and wellness instead of solely providing treatment for illness

or injury of students. For example, two universities in Texas that have established collaborative facilities include Midwestern State University, The Bruce & Graciela Redwine Student Recreation Center and University of Texas at San Antonio, Recreation & Wellness Center (Fullerton, 2011). Fullerton seems to be advocating for university health centers to become more relational as opposed to transactional in the delivery of healthcare to students on campus and in the local community.

Regarding the delivery of patient care, research has made known the importance of a trusting relationship between the doctor and patient as an accurate diagnosis hinges on the quality of this relationship (Kaba & Sooriakumaran, 2007). Over the past twenty years this relationship has transitioned away from a paternalistic model whereby the doctor is the gatekeeper of knowledge and silently chooses the appropriate course of action with very little, if any, input from the patient regarding the doctor's decision for the treatment plan (Kaba & Sooriakumaran, 2007). The model of the doctor-patient relationship that is favored today is known as mutual participation (Kaba & Sooriakumaran, 2007). In a model of mutual participation, the doctor-patient relationship places emphasis on patient centered medicine in opposition to the paternalistic model which emphasizes a predominately doctor-centered approach to medicine (Kaba & Sooriakumaran, 2007). In the mutual participation model, "the interaction between the patient and doctor is based on having equal power, mutual independence, and equal satisfaction" (Kaba & Sooriakumaran, 2007, p. 60). This patient-centered approach creates respect for the autonomy of the patient and often creates an atmosphere of friendship and partnership between the doctor and patient (Kaba & Sooriakumaran, 2007).

The traditional University Health Center (UHC), also known as Student Health Center (SHC) on some campuses, functions as a primary care medical facility on the campuses of universities and colleges in the U.S. They are staffed by physicians and/or nurse practitioners or other healthcare providers (i.e., physician assistants and pharmacists) with the goal of promoting, improving and advancing the health, well-being and overall success of college students (ACHA, 2017). As previously mentioned, SHCs primarily deal with the treatment of illness and injury, preventing illness, with some offering psychological, social, behavioral, and emotional counseling (ACHA, 2017). However, health care providers at SHCs are usually trained as primary care providers (e.g., family medicine physicians), and they may not be comfortable treating individuals with a chronic illness, such as asthma, that present with multisystem medical problems (Srivastava, Elkin, & Bilton, 2012).

The medical staff at the SHC of the research site consisted of twelve health care providers including six physicians and six nurse practitioners at the time of this study. In addition to the primary care physicians on staff at the SHC, there are two physicians trained in psychiatry that are available to provide specialty services for the mental health needs of students on campus. The SHC on a given campus represents one of several potential resources available for college students seeking treatment for asthma; resources available for the treatment of asthmatic students include the students' hometown primary care physician, a local primary care physician near the university, an asthma specialist (i.e., allergist or pulmonologist), the emergency department of the local hospital, or an urgent care center (Collins, et al., 2015). In a qualitative study of 20 international students, McLachlan and Justice (2009) discovered that even though the purpose of SHCs

is to help students deal with the physical and mental ramifications of university life their findings revealed that many students do not often seek out SHC services. The literature reveals that students may not seek out SHC services due to various reasons including the lack of awareness of the services offered at the SHC, lack of health insurance or lack of money, lack of confidence in the health services provided at the SHC, accessibility, and the students' lack of understanding of chronic disease management (Collins, et al., 2015). Furthermore, medical directors interviewed for the study stated that more face-to-face education was needed for students with asthma and marketing of SHC services on campus needs to be improved (Collins, et al., 2015).

Transition of Young Adults to an Adult-Oriented Health System

Young adults transitioning to college may be unprepared to manage their asthma or other chronic illness, and the college receiving them may not be able to meet their needs (Lemly et al., 2014). With advances in medical technology and treatment there are an increasing number of children with a chronic medical condition living into adulthood and many will attend college (Lemly et al., 2014). During their college years, students must learn how to manage their chronic illness, including scheduling and attending doctor's appointments, filling prescriptions, taking medications, and managing flare-ups all while balancing the demands of college life (Lemly et al., 2014).

The transition of young adults to adult-oriented health systems, which includes student health centers on college campuses, presents a challenge for students. As students transition from home to college and continue throughout their college years, they begin to assume primary responsibility for self-management of their health as well as responding to the stressors of college life and finding their way to an appropriate adult health care

system. Moreover, environmental, logistical, and social factors will challenge these students as they begin to assume self-management of their chronic illness (Ravert, Russell, & O'Guin, 2017). The literature reveals the transition from pediatric-based health care to an adult health care model requires a structured, comprehensive approach to improve the care of the college student (Unwin et al., 2013). It is likely that the transition from a pediatric physician practice to an adult-oriented health care system will require some purposeful planning (Lemly et al., 2014). The American Academy of Family Physicians, American Academy of Pediatrics, and American College of Physicians have provided recommendations for the transition of college students to an adult care model. The recommendations of these professional organizations include: “(1) a transition plan created by the student’s current physician practice, the sending practice, (2) clinician checklist for transitioning college students, and, (3) orientation to the adult healthcare model for the student by the college or university health center, the receiving practice” (Unwin et al., 2013, p. 596). Unwin et al. (2013) recommends a clinician checklist for a transitioning college student that includes the following:

- meet privately with the student for part of the initial visit;
- assess student and family readiness for transfer to a new physician;
- identify possible physician and speak with the selected physician;
- encourage assumption of increased responsibility for his/her health care management;
- ensure that the student understands his/her health conditions and medications;
- send copies of reports, letters, and tests to the student and his/her family;

- provide anticipatory guidance on health insurance, substance abuse and smoking, and their specific health condition;
- medical decision-making and legal matters;
- transfer medical records;
- assess the student's ability to make independent decisions regarding health care; and,
- provide a pocket card of conditions and medications. (p. 600)

The Society for Adolescent Medicine (SAM) has published a position paper to outline the principles of successful transition from adolescent health care to adult health care. SAM advocates for a proactive approach in planning the transition of adolescents with chronic health conditions to an adult health care system (Rosen, Blum, Britto, Sawyer, & Siegel, 2003). The position paper of SAM states, “the goals of an organized, coordinated transition to adult health care for young people with chronic conditions are: to optimize health and to facilitate each young person's attaining his or her maximum potential” (Rosen et al., 2003, p. 309). The basic principles of transition that have been endorsed include:

- services need to be appropriate for both chronological age and development;
- many young adults with chronic conditions are at a higher risk than peers for unnecessary dependency, developmental difficulties, and psychological delay;
- transition programs should be flexible enough to meet the needs of a wide range of young people, health conditions, and circumstances; and,

- health care transition is most successful when there is a designated professional who takes responsibility for the process. (p. 310)

Furthermore, a policy statement was created by the American Academy of Pediatrics and the Health Resources and Services Administration of the Department of Health and Human Services and is endorsed by the American Academy of Family Physicians, the American College of Physicians-American Society of Internal Medicine, and the Society of Adolescent Medicine to improve transition of young adults with chronic health conditions to an adult health care system (Rosen et al., 2003). The policy statement created consists of six critical first steps to improve the transition to adult-oriented care:

- (1) ensuring that all young people with special health care needs have a health care provider who takes specific responsibility for transition in the broader context of care coordination and health care planning;
- (2) identification of the core competencies required by health care providers to render developmentally appropriate health care and health care transition and ensuring that these skills are taught to primary care providers and are an integral component of the certification requirements;
- (3) development of a portable, accessible, medical summary to facilitate the smooth collaboration and transfer of care among and between health care professionals;
- (4) development of up-to-date detailed written transition plans, in collaboration with young people and their families;

- (5) ensuring that the same standards for primary and preventative care are applied to young people with chronic conditions as to their peers; and,
- (6) ensuring that affordable, comprehensive, continuous health insurance is available to young people with chronic health conditions throughout adolescence and into adulthood. (p. 310)

The literature emphasizes the need for students with a chronic illness to develop competence in self-managing their diseases and to build confidence in advocating for themselves in the arena of adult health care. Unwin et al. (2013) declares one of the goals of planning for the transition of a college student to the adult healthcare model is to foster health care independence. However, in an article published by Baumgartner (2011), she found that although respondents (who had a chronic illness) valued independence, they recognized the need for interdependence due to their physical limitations. The literature points to the value of recognizing the interdependence of students with a chronic illness. In a 1998 study by Zaleski, Levey-Thors, and Schiaffino, which consisted of 95 college freshmen, the authors found that, “high family support exacerbated the problems faced by students in their adaptation to college because, during the college transition, family support may have impeded students’ ability to find their individual role at college and gain emotional independence” (Zaleski et al., 1998, p. 134). To assist the student in this transition process, online websites such as Family Doctor (<http://familydoctor.org>) and the Centers for Disease Control and Prevention (<http://www.cdc.gov/family/college>) provide useful health resources for college students and their families (Unwin et al., 2013). However, the literature reveals that there is no substitute for current best practice guidelines which recommend a face-to-face meeting where the health care provider

discusses the student's role in taking on responsibility for his/her health care and developing the skills needed to ready for transition (Beal et al., 2016). A face-to-face meeting between the adult health care provider and the student may address scheduling and keeping appointments, ongoing monitoring of health issues, managing medications, and managing daily activities (Beal et al., 2016). Fedele et al. (2009) suggests that students with asthma may benefit from a brief intervention at the student health center on their college campus to improve adherence to medication and learn coping strategies.

There is a concern with the transition to college that the subsequent competing tasks of college life will supersede health care, which is of a concern for students with a chronic condition (Beal et al., 2016). In a study by Maslow et al. (2013) the researchers developed a program that paired 20 high school age students with a chronic illness (cystic fibrosis, diabetes, epilepsy, cerebral palsy) with 18 college mentors, who also had a chronic illness. The focus of the program was to develop attributes in the youths such as competence, confidence, character, compassion, and social connectedness (Maslow et al., 2013). One alumnus of the program stated, "They taught me how to successfully deal with my illness and not sacrifice my health or my goals to achieve the life that I want" (Maslow et al., 2013, p. 182). Another alumnus stated, "Meeting people with similar problems and people who had more experience dealing with these issues was so helpful both mentally, emotionally, and for getting advice when I was having a flare-up" (Maslow et al., 2013, p. 182). Some of the major successful outcomes of this program were that alumni did well transitioning from pediatric to adult health care, learning real-life skills related to self-management of their chronic illness, and a larger percentage of alumni attended college when compared to other youth with a chronic illness (Maslow, et

al., 2013). In a review article by Srivastava et al. (2012), the literature reviewed by the authors reports that adolescents preparing to transition to adult health care wanted: continuity of care, healthcare provider knowledge of disease, honesty, confidentiality, a named staff member, and clinic hours that are less disruptive. However, the authors of this review article state, “adult physicians feel unfamiliar with chronic disease as it is frequently a multisystem illness, so they tend to be more reactive to illness than proactive” (Srivastava, et al., 2012, p. 231). They also found that adult physicians who have a future-focused approach, as opposed to being reactive to illness, better serve students with a chronic illness. Chronic respiratory diseases like asthma and cystic fibrosis have visible physical symptoms such as cough, sputum expectoration, and breathlessness that are socially embarrassing. Students may feel isolated and ashamed if they are not able to fit in with their peers due to these symptoms while participating in sports or taking trips (Srivastava et al., 2012). Keeping students with chronic illness healthy benefits all as they transition to successfully contributing to society.

The evidence presented here informs the current research in the areas of the challenges of the student transitioning to the college campus environment from several key articles. One of the challenges presented in the literature is how to proceed with purposeful planning involving the student, parents, and healthcare providers (i.e., hometown primary care physician and physicians at the student health center on campus) when a student with a chronic illness transitions to college (Lemly, et al., 2014). Unwin et. al. (2013) has also proposed a structured, coordinated health care transition plan from the child to the adult health care model. Another key area uncovered in the evidence is once students transition to college it is important for them to learn how to self-manage

their chronic illness throughout the college years (Lemly, et al., 2014). As the student with a chronic illness transitions to the college campus the evidence presented here recommends a face-to-face meeting between the student with asthma and the healthcare provider on campus (Beal et al., 2016). In another article, Unwin et al. (2013) recommends the physician at the student health center establish a private meeting with the student with asthma to encourage the student to take on increased responsibility for his/her health care management. And lastly, the transition of college students with asthma may be complicated by the fact that “adult physicians working in college health may feel unfamiliar with chronic disease as it is frequently a multisystem illness, so they tend to be more reactive to illness than proactive” (Srivastava, et al., 2012, p. 231).

Role of Insurance and Access to Healthcare Services

Successfully transitioning to college for students with a chronic illness includes the consideration of the role of health insurance and access to health care services. Most college students (64%) are covered under their parent’s health insurance plan, 13% are covered by college/university-sponsored plans, and approximately 9% are uninsured (Unwin et al., 2013). However, Lemly et al. (2014) reports that nearly half of all schools do not require proof of health insurance before enrolling in their institution. Another factor to consider is that the student health center at a given college/university may not be designated as primary care or the student health center may not be considered in-network on some health insurance plans (Lemly et al., 2014). Whether a student is covered or not he/she has ongoing needs for medication refills, disease specific monitoring, and access to health care services. In a study by Scal, Davern, Ireland, and Park (2008), the authors examined the effect of the transition to adulthood on financial and non-financial barriers

to care in youth with asthma. This was a retrospective study which analyzed survey data from the National Health Interview Survey of 1539 adolescents, age 12-17 years and 833 young adults, age 18-24 years. The authors of this study report that college students are faced with two major dilemmas: (1) becoming an adult drastically reduces the student's eligibility for public health insurance programs, and (2) as a young adult he/she may no longer be eligible as a dependent in a family's private health insurance plan. As students transition to college, they will have questions of how to navigate their health insurance plan or questions of how to obtain healthcare or what to do if they are uninsured. The literature emphasizes it is the student's responsibility to be knowledgeable about their insurance plan, coverage, and how to make a claim (Unwin et al., 2013). However, Scal et al. (2008) suggest that insurance coverage alone does not answer the question of why some students with a chronic illness, that are covered by health insurance, have high rates of delay in seeking care and have unmet needs. The literature is sparse when addressing the issue of the attitudes and behaviors of young adults with a chronic illness in seeking health care (Scal et al., 2008). Carpentier et al. (2007) revealed, "a high percentage (40%) of college students with asthma do not seek medical attention for asthma symptoms despite believing the symptoms are severe enough to warrant medical care" (p. 119). Even if a student with a chronic illness has health care coverage, the literature reveals that having health care coverage is no guarantee the student will access health care services during a flare-up to seek treatment (Scal et al., 2008).

Psychological and Emotional Distress of College Students

Psychologists have hypothesized that college students with a chronic illness experience psychological distress (e.g., anxiety, depression, and global distress), have

lower cumulative GPAs and miss more days of school and work due to health reasons (Carpentier et al., 2007). In searching for an answer to why students with a flare-up of their chronic illness delay or do not seek treatment, psychologists utilize the term “illness uncertainty” which refers to, “the inability of an individual with a chronic illness to determine the meaning of an illness-related event or to accurately predict outcomes related to the illness owing to a lack of appropriate cues” (Carpentier et al., 2007, p. 120). Another term used by psychologists is “illness intrusiveness”, which is defined as “the degree to which illness-induced impediments are experienced as interfering with valued life activities” (Carpentier et al., 2007, p. 120). In the study by Carpentier et al. (2007) the investigators examined the differences in psychological, academic, and work functioning between college students with and without asthma and identified predictors of functioning. Participants in this study consisted of 121 students with asthma and 121 students without asthma. Study participants completed a background information questionnaire and three different instruments to collect data for the study as follows: (1) Brief Symptom Inventory, (2) The Mishel Uncertainty in Illness Questionnaire, and (3) Illness Intrusiveness Scale. The investigators in this study identified illness uncertainty and illness intrusiveness as potential indicators of poor functioning in college students with a chronic illness in the areas of psychological, academic, and job performance. Based on this study, the evidence reveals that college students with asthma have higher levels of anxiety and general psychological distress when compared to college students without asthma. Furthermore, the study results show college students with asthma have an increased number of missed school or workdays due to health reasons when compared to healthy college students, and the students with asthma may experience more intrusion

in their daily lives due to health-related problems that contribute to their psychological distress. The conclusion of this study asserts that illness uncertainty and illness intrusiveness have emerged as significant predictors of anxious and depressive symptoms and general psychological distress for students with a chronic illness (Carpentier et al. 2007).

Another topic discussed in the literature is the concept of the perspective of the individual in coping with chronic illness. In a metastudy of 292 qualitative research reports on chronic physical illness, the shifting perspectives model was developed (Paterson, 2001). The shifting perspectives model states that, “living with chronic illness is an on-going, continually shifting process in which people experience a complex dialectic between themselves and their world” (Paterson, 2001, p. 23). This shifting perspective determines how people with a chronic disease respond to the disease, themselves, caregivers, and situations that are affected by the illness, such as school or work. Paterson (2001) presents two overlapping perspectives represent the shifting perspectives model, illness in the foreground and wellness in the foreground. These “perspectives” shift as the reality of the illness experience and its personal and social contexts change (Paterson, 2001). If a person tends to be absorbed in his/her illness this would indicate the illness-in-the-foreground perspective. In this perspective, the person views his/her chronic illness as destructive to self and others, which leads to a focus on the sickness and burden associated with living with a chronic illness (Paterson, 2001). In contrast, the “wellness-in-the-foreground” perspective is characterized by “a person who envisions chronic illness as an opportunity for meaningful changes in relationships with the environment and others” (Paterson, 2001, p. 23). In addition, Paterson states, “the

wellness-in-the-foreground perspective states that the self, not the diseased body, becomes the source of identity; the body does not control the person, but it is something to which things are done” (Paterson, 2001, p. 23). Furthermore, this study goes on to say the ways in which people with a chronic disease acquires the wellness-in-the-foreground perspective is by “learning as much as they can about the disease, creating supportive environments, developing personal skills such as negotiating, identifying the body’s unique patterns of response, and sharing their knowledge of the disease with others” (Paterson, 2001, p. 23). The wellness-in-the-foreground perspective allows the person to focus on the emotional, spiritual, and social aspects of life instead of the diseased body thereby lessening the effects of the disease. In addition, the author emphasizes these two perspectives are in constant flux for individuals living with a chronic illness; also, the perspectives on chronic illness are not viewed as right or wrong but instead reflect people’s needs and situations. Paterson (2001) concludes by stating that, “the role of health care professionals becomes, therefore, to assist people with chronic illness to identify and understand their perspectives about the illness” (p. 25).

This section of the literature informs this dissertation research in the area of psychological functioning of college students with asthma. The key evidence presented here suggests college students with asthma have increased anxiety, general psychological distress, and numbers of missed school or workdays due to health reasons as compared to healthy students (Carpentier et al., 2007). As well, Paterson’s (2001) work explains the possibility of continual shifts between an illness and wellness perspective of those with chronic illness, which may affect the way individuals experience their lives with and responses to their chronic diseases.

Identifying the Student With a Chronic Illness

The literature reveals that most institutions of higher education do not have an established electronic system or other systematic method of identifying students with a chronic illness (Lemly et al. 2014; Unwin et al. 2013). In a study of 200 institutions by Lemly et al. (2014), the authors found that most colleges did not have a system to identify incoming students with chronic illness nor did the majority of schools provide an initial appointment or check-in. This study also revealed that private or eastern schools were the most likely institutions to identify incoming students with a chronic illness or provide an initial appointment or check-in (Lemly et al., 2014). This research indicates that most students with a chronic illness may fall through the cracks of their newfound adult-oriented health system (the student health center) on a college campus. When a student with a chronic illness arrives on campus, particularly at a large university, they can become lost in a void unaware of access to healthcare services at the student health center. In an article by Reece et al. (2002), the investigators conducted a cross-sectional descriptive study which examined 215 college students with asthma attending an urban university. The investigators in this study found that even though all 215 students in their study were aware of and had access to the student health center, many did not use it (Reece, 2002). Lemly et al. (2014) investigated primary care services on campus for three common chronic conditions: asthma, Type I diabetes, and depression. This study assessed the capacity of the student health centers on college campuses to provide primary care services and manage students with chronic illnesses. Researchers found that for the 200 institutions surveyed most schools could provide primary care for the three common chronic conditions: 84% for the student with asthma, 63% for diabetes, and 72% for

depression. Regarding primary care for asthma, however, Collins et al. (2015) found that even if the student health center offers asthma care most exhibited a lack of each of the following: (1) effective asthma management strategies, (2) use of individualized asthma action plans, and (3) an emergency action plan for asthma exacerbations on campus. In general, the evidence reveals asthma related healthcare on the college campus may be improved in the following manner: development of a systematic way to identify students with a chronic illness, establishing better marketing methods for awareness of the SHC and the asthma care services offered there, and the development of new approaches to asthma care in the university setting including asthma education programs, individualized asthma action plans, and emergency protocols for students experiencing an asthma flare-up (Collins et al. 2015; Lemly et al. 2014; Reece et al. 2003).

Another real threat on campus for students with asthma is the lack of treatment for an asthma flare-up during the hours when the SHC is closed. The Lemly et al. (2014) study relates that most institutions do not provide urgent care services during the evening on weekdays nor on the weekends. Of the institutions surveyed, 6% of student health centers were open evening weekdays, and 10% were open on weekends to provide urgent care services. A student may experience a flare-up of his/her asthma, diabetes, or depression at a time of the day, evening, or night when the student health center is closed, which reinforces the need for purposeful planning on the part of the student. The purposeful planning of the student might include how to manage a flare-up; meaning, where to go for treatment during the days or hours that the student health center is closed. When seeking treatment, students with a chronic illness attending college may have different options depending on the time and day of the week. Options for treatment

include the student health center, their hometown primary care physician, an urgent care center, a physician specialist (i.e., allergist or pulmonologist), or the local hospital's emergency department (Collins et al., 2015).

Given many students with chronic diseases, for a multitude of reasons, may not proactively seek out the resources on campus or in the college community they need continued education and management of their diseases. Colleges and universities need to better plan for and implement procedures for identifying the healthcare needs of their students. Indeed, the capacity to identify students with asthma on a college campus is paramount in reaching out to this vulnerable population.

Learning About Asthma

For students with a chronic illness learning is key to their success in gaining independence with their care. The literature indicates: (1) individuals with a chronic illness utilize various types of learning, (2) learning is a social activity, (3) diagnosis of a disease and subsequent learning involves emotions, and (4) people with chronic illness experience barriers to learning (Baumgartner, 2011).

To become independent, Baumgartner (2011) states, "The individual will need to learn about symptom management, the disease process, and how to recognize the course of the disease" (p. 11). This dovetails with one of the primary goals of the NAEPP (2007) which states, "educating people who have asthma in the self-management skills of self-assessment, use of medications, and actions to prevent or control exacerbations, results in the reduction in urgent care visits and hospitalizations, reduction of asthma-related health care costs, and improvement in health status" (p. 96). Students with a chronic disease also

need to learn how to evaluate health information as being appropriate and accurate regarding their chronic illness.

Individuals with a chronic illness utilize various types of learning including self-directed, informal, and incidental learning (Baumgartner, 2011). According to Baumgartner, “self-directed learning is central to coping with a chronic illness” (p. 8). In addition, she states self-directed learning is a process whereby the student with a chronic illness may learn how to better cope with his/her disease. It is defined as, “a process in which individuals take the initiative in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes” (p. 8). Self-directed learning may lead to the student changing his/her worldview, feeling more empowered, and building his/her confidence in overcoming barriers. However, the self-directed learning process can be experienced differently between women and men. Women often view self-directed learning as a social activity, feel more connected to others, and feel that emotional support from others is vital to the process (Baumgartner, 2011). In contrast, Baumgartner (2011) found that men were less likely to speak to others about their disease. Moreover, she continues commenting that men preferred isolated ways to learn about their disease reading print material and the Internet. Baumgartner states that, “both men and women used self-directed learning to make treatment choices, but had difficulty dealing with emotions involved in diagnosis and the self-directed learning process” (p. 8).

The literature also reveals the significance of informal and incidental learning for the chronically ill (Baumgartner, 2011). Informal learning is, “any activity involving the

pursuit of understanding, knowledge or skill which occurs without the presence of externally imposed curricular criteria” (Livingstone, 2001, p. 4). Incidental learning is the unintended outcome of a learning experience (Keeping & English, 2001). In a qualitative study of eight patients who received continuous ambulatory peritoneal dialysis (CAPD), the researchers interviewed the patients and found they used informal and incidental learning to cope with their illness (Keeping & English, 2001). The patients in the study stated that CAPD allowed them to live a somewhat normal life; however, they did experience barriers to learning including, “a diminished sense of personhood in which they felt diseased and different because they were catheterized” (p. 320).

Related to the topic of learning about a chronic illness is the health information-seeking habits of college students. In a study conducted by Percheski and Hargittai (2011), the authors surveyed over 1,000 college students, the majority (97%) were 18 or 19 years old, about their health information seeking habits. The results revealed the most popular source (89.5% of respondents) of health information for students is family and friends. In addition, the study reported the next most popular source (78% of respondents) was web sites, medical professionals, and traditional media (e.g., newspapers, magazines, radio, and television). Regarding gender, the authors’ state, “female students were more likely than male students to use all sources of health information” (Percheski & Hargittai, 2011, p. 382). The authors noted that a limitation of their study was that it did not assess the health status of the students who were surveyed. The American College Health Association (2016) reported on the preferred sources of health information for college students. This report revealed the top four sources of health information most used by college students were as follows: (1) parents (77%), (2)

Internet/Web (73%), (3) friends (60%), and (4) medical staff (59%). Other sources of health information reported in the AHCA document include leaflets/pamphlets (56%), health educators (54%), and faculty/coursework (38%) (ACHA, 2016). In addition, the ACHA listed the following as the most believable sources of health information for the college student: (1) medical staff (91%), (2) health educators (90%), (3) faculty/coursework (68%), and (4) parents (67%). Both studies cited here found very similar results for the top two sources of the preferred sources of health information of college students, family/friends and internet/web sources. When the data for the most believable sources of health information, as reported by the AHCA (2016), are integrated into the discussion we notice that parents/friends drops out of the top spot of sources of health information and are replaced by medical staff and health educators. The Percheski and Hargittai (2011) study revealed that college students who seek health information online also seek information from medical professionals and family and friends. These data regarding the health information seeking habits of college students inform my dissertation research regarding the importance of how and where college students obtain their health information; the evidence reveals family/friends play a prominent role.

Theoretical Framework: Experiential Learning

Merriam and Bierema (2014) state, “learning theories are explanations of what happens when learning takes place” (p. 25). These authors suggest that in the Western world Aristotle and Plato are foundational philosophers for how we think about knowing and learning. Aristotle’s philosophy asserts that “knowing was a sensory experience, meaning, we come to know through our five senses, and for Plato knowing involved introspection” (p. 24). Gagne (1985) added to our definition of learning by positing,

“Learning is a change in human disposition or capacity that persists over a period of time and is not simply ascribable to processes of growth” (p. 45). And, John Dewey’s theory of the method of knowing holds, “knowledge consists of our intellectual resources, all of the habits that render our action intelligent” (Quay, 2013, p. 45). The preceding paragraph presents a brief historical perspective of learning through experience. In the Western world, theorists contend that learning through experience is multidimensional and involves the human faculties of intelligence, our five senses, emotions, self-examination, the habits of our human nature and our capacity to persist over time in the quest for learning. From the perspective of learning by experience presented here, it is my assessment that the adult learner is challenged to dispose themselves and prepare to learn by engaging in an active process which includes the use of his or her human faculties.

David Kolb is one proponent of experiential learning theory (ELT), which informs the theoretical framework for my dissertation research; my dissertation study specifically focuses on his model of ELT. Kolb defines ELT as, “a naturalistic ongoing process of direct learning from life experiences contrasted with the systematic learning of formal science and education” (2015, p. xx). Many philosophers from the fields of social psychology, philosophy, and cognitive psychology were influential in Kolb’s development of ELT including Lev Vygotsky, Kurt Lewin, John Dewey, Jean Piaget, William James, Carl Rogers, Carl Jung, and Paulo Freire. The purpose of ELT, as espoused by Kolb, is to serve as a framework for integrating the components of the theory into the workplace, the family, the community, and the classroom (Kolb, 2015).

ELT and Learning From Experience

Kolb (2015) emphasizes, “the learning process for all human beings represents a primary adaptation that is critical to our survival in the physical and social worlds” (p. 1). However, in the past the U.S. concept of the learning process has been centered on the rational, scientific, and technological concepts (Kolb, 2015). In the U.S., the learning process itself has been historically defined by rationalism and behaviorism; in contrast, ELT is an alternate way of viewing the learning process in which experience is the foundation of personal learning and development (Kolb, 2015).

People do learn from their experiences as evidenced by institutions of higher education in the U.S. awarding increasing numbers of credit hours to students with prior learning experience (Kolb, 2015). ELT is not without its critics and skeptics who tout that ELT is a fad and appears too pragmatic for the academic mind or it consists solely of new techniques for the educator’s bag of tricks (Kolb, 2015). However, ELT answers the critics by offering the concept of education and learning as a lifelong process that, “is soundly based in intellectual traditions of social psychology, philosophy, and cognitive psychology” (Kolb, 2015, p. 3). The ELT model creates a framework that links education, work, and personal development (Kolb, 2015).

The premise of ELT is that an individual learns by creating knowledge through transformation of experience; it holds that learning may be described as a process of adaptation to the world (Kolb, 2015). According to Kolb, (2015) learning is an eclectic activity which integrates the functioning of the total human body – thinking, feeling, perceiving, and behaving. Critical aspects of ELT include the following:

(a) emphasis on the process of adaptation and learning as opposed to content or outcomes, (b) knowledge is a transformation process, being continuously created and recreated, (c) learning transforms experience in both its objective and subjective forms, and (d) to understand learning, we must understand the nature of knowledge, and vice versa. (p. 50)

Furthermore, knowledge results from a combination of grasping and transformation experience. Grasping experience refers to an individual taking in information and transforming the experience by interpreting that information and finally acting on that information (Kolb, 2015). The experiential learning cycle of Kolb (2015) consists of two related modes of grasping experience – Concrete Experience (CE) and Abstract Conceptualization (AC) – and two related modes of transforming experience – Reflective Observation (RO) and Active Experimentation (AE). This learning cycle is an idealized process whereby, “the learner integrates each of the four modes: experiencing (CE), reflecting (RO), thinking (AC), and acting (AE) in a repetitive process that is sensitive to the learning situation and what is being learned” (Kolb, 2015, p. 51). The learning cycle of ELT is viewed as learning on the move and is driven by the commitment to the dialogue of both action/reflection and experience/abstraction (Kolb, 2015).

ELT and the Structure of Learning and Knowledge

The two basic structural dimensions of the learning process are rooted in the fields of philosophy, psychology, and physiology (Kolb, 2015). The two structural dimensions outlined by Kolb (2015) are as follows:

(a) first is a prehension dimension that includes two dialectically opposed modes of grasping experience, one via direct apprehension of immediate concrete experience, the other through indirect comprehension of symbolic representations of experience, and (b) second is a transformation dimension, which includes two dialectically opposed modes of transforming experience, one via intentional reflection, the other via extensional action. (p. 85)

Jim Zull, a colleague of Kolb's at Case Western Reserve University, proposed, "the knowledge in our minds consists of neuronal networks in our brains which are constructed through learning from experience" (Zull, 2002, p. 112). Zull (2002) proposed a link between the learning cycle and brain functioning. He emphasizes that learning from experience occurs through physical changes in the brain including modification and growth of the neuronal networks in the brain (Zull, 2002). The experiential learning cycle as Zull relates it to brain anatomy and functioning is as follows: "(a) concrete experiences come through the sensory cortex, (b) reflective observation involves the integrative cortex at the back, (c) creating new abstract concepts occurs in the frontal integrative cortex, and (d) active testing involves the motor brain" (Zull, 2002, p. 21). Finally, a summary of Zull's implications and recommendations for educators and learners include, the opportunity for deep learning is enhanced with a balanced use of all four learning modes and their corresponding parts of the brain, emotion is an important influencing factor in the thinking process, physical changes occur in the brain when we learn, learning how to learn should be a focus of education, and it is better to start with concrete examples rather than abstract principles (Zull, 2002).

The learning process is not identical for all human beings; the study of human individuality is contrasted with the study a chemical sample or compound (Kolb, 2015). If the chemical sample is found to have impurities, then the researcher would most likely discard that sample if it does not perform according to the laws of chemistry (Kolb, 2015). However, this would not be the case with a human being sample whose uniqueness and individuality are highly valued (Kolb, 2015). In understanding human individuality, Kolb's epistemological approach is rooted in contextualism. In contextualism, he states, "the person is examined in the context of the emerging historical event, in the processes by which both the person and event are shaped" (p. 99). In the contextualist view, "reality is constantly being created by the person's experience" (Kolb, 2015, p. 99).

According to Kolb (2015), the structure of knowledge consists of two types of knowledge: (1) personal knowledge, and (2) social knowledge. Personal knowledge is the here-and-now unfolding of the combination of experience and actions; and social knowledge involves an interpretive process which incorporates the independent, socially, and culturally transmitted network of words, symbols, and images. Based on these two kinds of knowledge one might assume that social knowledge stands alone from the personal experience of the user. However, Kolb (2015) states, "social knowledge cannot exist independently of the knower but must be continuously recreated in the knower's personal experience" (p. 159). The experience of the knower may be through concrete interaction with the physical and social world or through the media of symbols and language. For the individual to understand these words and symbols requires a

transformational process whereby the knower interprets the information to render personal knowledge and meaning (Kolb, 2015).

Knowledge results from the combination of grasping experience and transforming it. The individual's perception of experience is not sufficient for learning; something must be done with it, acting on the information taken in from the experience (Kolb, 2015). Kolb refers to Piaget's thoughts on how knowledge is created. For Piaget the sensations or perceptions are only the beginning of knowing, "it is the organization and transformation of these sensations through action that creates knowledge" (Kolb, 2015, p. 155).

Kolb (2015) also explains the concept of a learning environment in the context of an educational program or classroom session. In managing the learning process, Kolb views a classroom session as having degrees of orientation toward each of the four learning modes in the learning model: affective, perceptual, symbolic, and behavioral. These labels describe the overall climate they create and the particular learning skill or mode they require. An affective environment, "emphasizes the experiencing of concrete events; a symbolic environment emphasizes abstract conceptualization; a perceptual environment stresses observation and appreciation; and a behavioral environment stresses action taking in situations with real consequences" (Kolb, 2015, p. 277).

Of the four learning modes discussed by Kolb (2015), the behavioral learning mode, in my assessment, is the most applicable to the student trying to cope with the challenges of self-managing his or her asthma on the college campus. In a study of 215 students with asthma, Reece et al. (2002) found that participants with moderate to severe asthma were more likely than participants with mild asthma to have received education

on inhaler use. The fact that this study revealed the lack of basic asthma education for all students with asthma on a college campus, regardless of asthma severity, confirms the vulnerability of this population of higher education students living with a chronic illness.

The college campus itself may be described as a complex learning environment in terms of the difficulty in finding a practical solution for the optimal treatment and care of students with asthma. Kolb (2015) describes a behaviorally complex learning environment as, “one in which the emphasis is upon actively applying knowledge or skills to a practical problem. The problem to be solved is something the learner can relate to, value, and feel some intrinsic satisfaction from being solved” (Kolb, 2015, p. 278). Solving the problem of providing optimal education and management of asthma on the college campus presents unique challenges. However, Kolb (2015) offers insight into ELT that may be applied to the complex learning environment of the college campus, particularly the SHC. In the dimensions of the learning space of the college campus, ELT offers the following: “learning is not one universal process but a map of learning territories, a frame of reference within which many different ways of learning can flourish and interrelate” (Kolb, 2015, p. 291).

Summary

This chapter provided a literature review related to education and management of asthma on the college campus. The summary of findings of the literature review are as follows:

- The transition from pediatric care to an adult healthcare system requires purposeful planning on the part of students and healthcare professionals.

- Health care transition is most successful when there is a designated professional who takes responsibility for the process.
- There is a need for colleges to provide increased support for students with chronic conditions.
- Students learning about their chronic illness is integral to coping with their chronic illness.
- Students with a chronic illness want situational knowledge of the implications the college environment will have on their condition, services on campus to aid in effective coping strategies, access to knowledgeable campus health professionals, and support from their peers and campus health care providers.
- Students may experience barriers to learning about their chronic disease including lack of access to health professionals with specific knowledge about their disease, lack of ability to evaluate health information on web sites, lack of time or energy to attend an educational class or seminar, and lack of a support group.
- According to ELT, knowledge results from a combination of grasping and transformation experience.
- In addition, ELT states that the individual's perception of experience is not sufficient for learning; something must be done with it, interpreting and acting on the information taken in from the experience.
- Students with a chronic illness need to develop competence in self-managing their disease with the goal of becoming independent with their care.

- Deficiencies on campus may include the lack of a system in place to identify students with a chronic illness, lack of resources at the student health center to manage and treat students with a particular chronic illness, and lack of awareness of access to the student health center on the part of the student with a chronic illness and lack of a support group.
- Students with a chronic illness experience financial burdens in paying for healthcare expenses, i.e., health insurance, medications, diagnostic tests, doctor visits, hospitalization, and urgent care visits to the emergency department.
- Students with a chronic illness having health insurance coverage is no guarantee the student will access health care services during a flare-up to seek treatment.
- Like their peers, students with a chronic illness are not immune to the usual “temptations” of college life such as alcohol abuse, recreational drugs, tobacco use, and expressing their sexuality.
- Students with a chronic illness experience not only physical symptoms but also psychiatric symptoms such as generalized anxiety, depression, social phobia, and dysthymic disorders.
- There are deficiencies on college campuses that leave students with a chronic illness vulnerable and at risk for poor academic performance, decreased quality of life, increased absenteeism from work or school, and lower graduation rates.

In addition, the reviewed literature demonstrated six themes: (1) the importance of purposeful planning of the transition of young adults from pediatric care to an adult-oriented healthcare system, (2) traditional age (18-25 years) and non-traditional age (26 years and older) students with asthma are at risk of a life-threatening asthma flare-up during their college years, (3) the role of health insurance and access to healthcare services on a college campus, (4) the presence of psychological and emotional distress of college students with a chronic illness, (5) the importance in identifying the student with a chronic illness on the college campus, and (6) students' issues regarding learning about their chronic illness. Although there is sufficient literature related to various chronic illnesses and care of the college student, there is a paucity of literature available that engaged college students with asthma by qualitative research methods to gain students' perceptions and insights thereby giving them a voice.

III. METHODOLOGY AND RESEARCH DESIGN

A case study is an empirical inquiry that investigates a contemporary phenomenon (the ‘case’) in-depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident” (Yin, 2014, p. 16). This qualitative instrumental case study examined how students with asthma learn from their experiences to self-manage their asthma while enrolled in college. In addition, this case study examined the perceptions of healthcare providers regarding the current state of education and management of asthma on campus. An instrumental case study is a “case that helps us to understand phenomena or relationships within it” (Stake, 1995, p. 77).

Yin (2014) states that the goals of a well-designed case study are “to collect, present, and analyze data fairly” (p. 3). The case study is used to contribute to our knowledge of individual, group, organizational, social, political, and related phenomena. Case study in education usually consists of an interest in the study of people or programs (Stake, 1995). The recommended approach to beginning a case study involves a three-step process: (1) a thorough literature review, (2) the construction of appropriate research questions, and (3) the adherence to a rigorous methodological path (Yin, 2014). The aim of a case study is to explain a current issue by designing research questions that ask how or why the social phenomenon works; utilizing research questions that address the how or why questions leads to the case study research being relevant (Yin, 2014). Many fields have made use of case study research to aid in gaining knowledge of individuals, groups, organizations, social, political, and related phenomena.

Yin (2014) offers a two-fold definition of case study which covers the scope and features of this approach to research. The first part of the definition begins with the scope of a case study:

A case study is an empirical inquiry that . . .

- investigates a contemporary phenomenon (the “case”) in depth and within its real-world context, especially when;
- the boundaries between phenomenon and context may not be clearly evident. (p. 16)

The second part of the definition of a case study describes the methodological aspects or features of the case study:

A case study inquiry . . .

- copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result;
- relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result; and
- benefits from the prior development of theoretical propositions to guide data collection and analysis. (p. 17)

In designing the case study, the researcher must keep in mind a “blueprint” for the research which will evolve and address at least four problems: “what questions to ask, what data are relevant, what data to collect, and how to analyze the results” (Yin, 2014, p. 29). As the research design evolves, five important components surface:

- a case study’s questions;

- its propositions, if any;
- its unit(s) of analysis;
- the logic linking the data to the propositions; and,
- the criteria for interpreting the findings. (p. 29)

Yin (2014) expands on each of these five components. In the development of research questions for a case study the most relevant questions will be discovered through the review of the literature and by examining a few key studies on the topic of interest. Yin (2014) states that the form of case study questions should be “how” and “why” questions. “What” questions are less desirable for a case study because Yin states this form of question may focus on minor parts of an issue. The second component is the study proposition. Each proposition “directs attention to something that should be examined within the scope of study” (p. 30). Stating the propositions of the study moves the researcher in the right direction to look for relevant evidence. The study questions and study propositions help the researcher to identify the relevant information about the case to be collected. Otherwise, as Yin explains, the researcher may easily get off track by covering everything about the case and going outside the feasible limits. In identifying the relevant information collected for my case, I developed the following study propositions:

- ineffective coping strategies of college students with asthma are linked to decreased quality of life (increased anxiety, sleep disturbances, missed school or workdays, increased risk of hospitalization from an asthma flare-up);

- college students' experiences of barriers to learning about asthma are linked to improper asthma self-management resulting in more frequent asthma symptoms; and,
- little or no training of healthcare providers specifically in asthma care is linked to limited or non-use of the national asthma guidelines for the treatment of asthma. (GINA, 2017; NAEPP, 2007)

The unit of analysis or the case is the third component outlined by Yin (2014). In describing the unit of analysis, the researcher needs to consider two steps: defining the case and bounding the case. The case can be defined as an individual, a small group, communities, programs, decisions, organizational change, a country's economy, an industry, or special events. Bounding the case is a way to clarify things such as the context for the case study and the specific time boundaries to define the beginning and the end of the case. The scope of data collection may be determined by establishing the boundaries of the case, in particular which data are the subject of the case (the phenomenon) and which data are external to the case (the context). The fourth component of research design is linking the data to the propositions, which relates to the steps of data analysis for the case. The analytic techniques utilized for a case study dovetail with the ways of linking data to propositions and include methodological triangulation and pattern matching. The analytic techniques I plan to use, namely methodological triangulation and pattern matching, will be discussed later in this chapter in the section titled, "Trustworthiness". Yin cautions the novice researcher in collecting too much data that were not later used during analysis or collecting too little data that prevented the use of

the proper data analysis technique. The fifth component of research design is establishing the criteria for interpreting a case study's findings (Yin, 2014).

The quality of any case study design may be judged by applying certain logical tests (Yin, 2014). Four tests have been designed to establish the quality of any empirical social research: construct validity, internal validity, external validity, and reliability. The definition of the four tests for quality are as follows: "construct validity focuses on identifying correct operational measures for the concepts being studied; internal validity seeks to establish a causal relationship, whereby certain conditions are believed to lead to other conditions, as distinguished from spurious relationships; external validity defines the domain to which a study's findings can be generalized and reliability which demonstrates that the operations of the study - such as the data collection procedures - can be repeated, with the same results" (Yin, 2014, p. 46). Construct validity is strengthened by using multiple sources of evidence and having key informants review a draft of the case study report (Yin, 2014). To strengthen internal validity, Yin (2014) recommends using the tactics of pattern matching, addressing rival explanations, and explanation building during the analytic phase of case study research. The tactics recommended for building external validity include using theory in single-case studies and using replication logic in multiple-case studies (Yin, 2014). And lastly, for reliability the use of a case study protocol for the data collection phase and the development of a case study database are expected to be performed (Yin, 2014).

The data collection phase of the case study begins with good preparation such as: "(a) the case study researcher has the desired skills and values, (b) training for a specific case study, (c) developing a protocol for the study, (d) screening the candidate cases, and

(e) conducting a pilot case study. In addressing the desired skills and values, a good case study researcher should exhibit desirable attributes such as:

- asking good questions and interpreting them fairly;
- being a good listener and not being trapped by preconceptions;
- staying adaptive when encountering new situations;
- having a firm grasp of the issues being studied; and
- avoiding biases by being sensitive to contrary evidence”. (Yin, 2014, p. 73)

In the plan for developing the case study, Yin (2014) recommends a study protocol that includes: (a) an overview of the case study, (b) data collection procedures, (c) data collection questions, (helps to remind the researcher of the information that needs to be collected), and (d) a guide for the case study report (outline, format for the data, bibliographical information). In addition, I secured approval from the Institutional Review Board (IRB) prior to collecting any data.

Collecting Case Study Evidence

Six possible sources of evidence for case study research are discussed by Yin (2014): documentation, archival records, interviews, direct observation, participant-observation, and physical artifacts. Yin (2014) emphasizes that no single source of evidence has a complete advantage over the others. Furthermore, good case study will incorporate as many sources as possible. Yin (2014) states that by using multiple sources of evidence the case study findings are more likely to be convincing and accurate. Furthermore, case study findings being supported by more than a single source of evidence, also known as data triangulation, helps to strengthen the construct validity of

the case study.

The theoretical framework is the foundation from which “all knowledge is constructed for a research study” (Grant & Osanloo, 2014, p. 12). The structure of the research study is dependent on utilizing a lens or common world view that supports the researcher’s thinking on the issues and analysis of data (Grant & Osanloo, 2014). The lens or theoretical framework that dovetails with my research is experiential learning theory (ELT). ELT is an appropriate lens in which to study how students with asthma learn from their experiences in self-managing their asthma during their college years. Asthma is a contemporary phenomenon which lends itself to an in-depth study within the real-world context of the college campus. ELT hinges on the process of adaptation and learning as opposed to content or outcomes and knowledge as a transformation process (Kolb, 2015). College students are challenged to adapt and learn from their experiences of how to self-manage a chronic illness amid the everyday challenges and stressors of college life.

The theoretical framework for this case study is from the perspective of David Kolb, one proponent of the experiential learning theory (ELT). ELT is defined by Kolb (2015) as, “a naturalistic ongoing process of direct learning from life experiences contrasted with the systematic learning of formal science and education” (p. xx). Kolb states, “ELT is a theory that helps explain how experience is transformed into learning and reliable knowledge” (p. xxi). Kolb’s experiential learning cycle consists of two dialectically related modes of grasping experience – Concrete Experience (CE) and Abstract Conceptualization (AC) – and two dialectically related modes of transforming experience – Reflective Observation (RO) and Active Experimentation (AE). This

learning cycle is an idealized process whereby, “the learner integrates each of the four modes: experiencing (CE), reflecting (RO), thinking (AC), and acting (AE) in a repetitive process that is sensitive to the learning situation and what is being learned” (p. 51). Kolb (2015) describes the four basic learning modes as follows:

- Concrete Experience (CE) emphasizes experiences that focus on feeling rather than thinking. In this mode people are concerned with human situations and are proficient at relating to others. This mode involves an “artistic” approach in contrast to a systematic, scientific approach to problems;
- Reflective Observation (RO) orientation focuses on seeking to understand a particular situation instead of practical application. Individuals who adhere to this mode of learning are good at looking at different perspectives and appreciating the viewpoints of others. People advocating this orientation value patience, impartiality, and thoughtful judgment;
- Abstract Conceptualization (AC) orientation emphasizes thinking as opposed to feeling. An individual that favors this mode of learning are all about using logic, ideas, and concepts; they are concerned with building theories. In tackling problems, individuals with this orientation are good at systematic planning, manipulation of abstract symbols, and quantitative analysis; and,
- Active Experimentation (AE) orientation emphasizes doing rather than thinking. This mode of learning focuses on actively influencing people and achieving results. Individuals who align themselves with this

orientation are good at accomplishing things and are willing to take risks to achieve their objectives. (p. 105)

Figure 1 illustrates the cyclic nature of the four basic learning modes of Kolb's experiential learning theory.

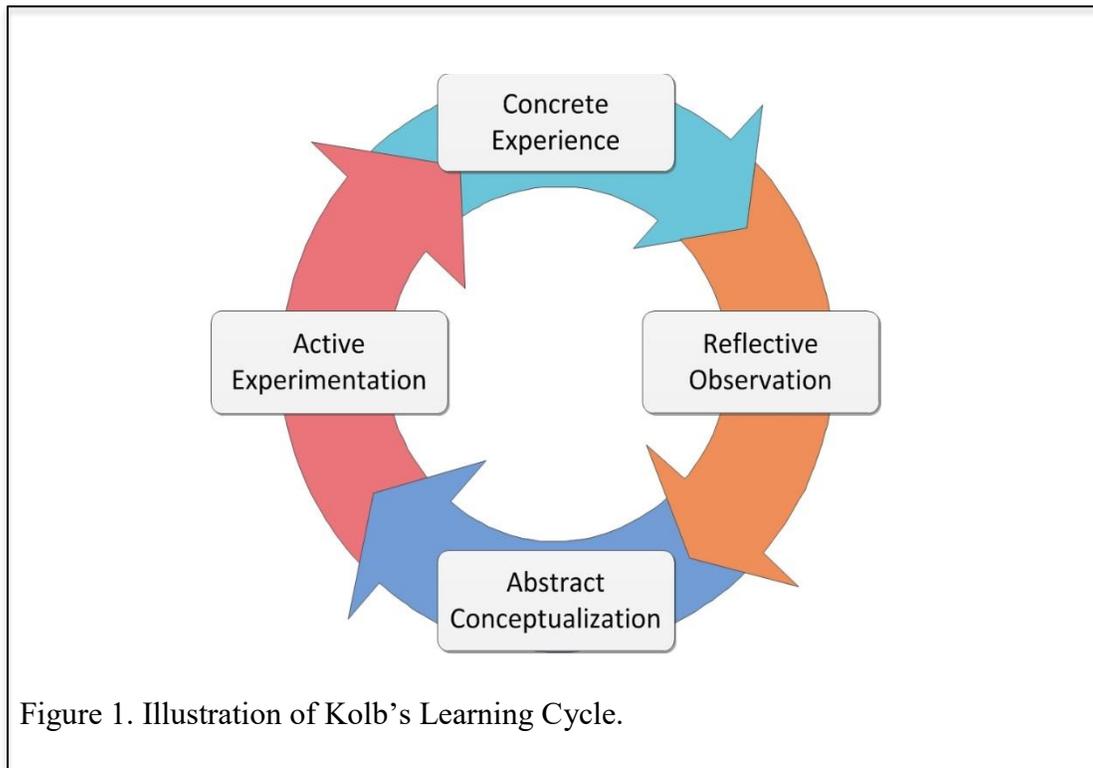


Figure 1. Illustration of Kolb's Learning Cycle.

Research Design

The purpose of this qualitative case study was to examine how college students learn from their experiences to self-manage their asthma during their college years and to examine the perceptions of healthcare providers regarding the current state of asthma education and management on campus. The overarching goal of this case study was to gather in-depth data and analyze the data fairly regarding the issues surrounding education and management of asthma on the college campus through the narratives of students and the healthcare providers on campus.

The research design was defined as, “*a logical plan for getting from here to there*, where *here* may be defined as the initial set of questions to be answered, and *there* is some set of conclusions (answers) about these questions” [italics in original] (Yin, 2014, p. 28). At least four problems may be addressed by an appropriate research design, and they are: (a) what questions to study, (b) what data are relevant, (c) what data to collect, and (d) how to analyze the data (Yin, 2014). The questions guiding the research are the first clue as to which research method is the most relevant to use in answering the questions (Yin, 2014). Furthermore, Stake (1995) proclaims, “The best research questions evolve during the study” (Stake, 1995, p. 33). The following research questions guided my study: (1) How do college students with asthma learn from their experiences in the self-management of their asthma during their college years?, (2) How do college students cope with their asthma on campus?, and (3) How do healthcare providers on campus perceive the current state of asthma education and management of college students on the campus?

The unit of analysis for this single case study is a large public university located in the southwest region of the United States. The units of observation consisted of college students with asthma enrolled at the university and the healthcare providers who care for them on campus along with the SHC documentation/processes. In this case study, observational data were collected to gain an in-depth description of the physical and social environment of the university including the students with asthma, the healthcare providers, and the SHC (Patton, 2002). The observational data were analyzed to gain better understanding of the behavior of students with asthma, issues with healthcare providers working in a SHC, and context of the case (Patton, 2002). The phenomena of

this case study are the learning experiences of college students with asthma amid the challenges and barriers to self-manage their asthma during their college years and the perceptions of the healthcare providers on campus and their learning experiences about asthma management. The context is a large public university in the southwest region of the United States with an extensive student health center, fully staffed with a clinical staff consisting of registered nurses, nurse practitioners, physicians, pharmacists, and clinical laboratory scientists.

Participant Selection

The data for this case study were collected in the real-world context of a large public university campus in the southwest region of the United States. I purposely recruited student participants with partially controlled asthma, which was determined by their numerical score on the asthma control test (ACT). Partially controlled asthma was classified as a numerical score of less than 20 on the ACT. An ACT score of less than 20 is an indication of partially controlled asthma which can typically be characterized as having a doctor's prescription for one or more asthma medications, experiencing weekly asthma symptoms, (e.g., wheezing and coughing) and needing to visit a healthcare provider for asthma care and/or treatment in the last 12 months.

My access to the healthcare providers at the SHC was obtained through the medical director. The medical director was contacted by me initially through an email message in December 2017, and I met with him face-to-face at the end of the fall semester to discuss the details of my proposed research study. In an email message a few weeks later, the medical director invited me to attend the staff meeting of the healthcare providers at the SHC to present my research proposal. I attended the staff meeting of the

healthcare providers in January 2018, presented an overview of my proposal for research, answered their questions, and invited them to consider volunteering to participate in my study. After the staff meeting, I recruited five volunteer participants consisting of two physicians and three nurse practitioners. The SHC medical director asked me to follow up with him for scheduling of the provider interviews upon receiving approval from the IRB for my study.

In addition to the five healthcare provider participants, five student participants were recruited on the university campus through an IRB approved email script (Appendix A) that was sent out via email directly from the SHC. All five student participants had been previously diagnosed by a physician with asthma. The medical director gave me approval to recruit the five student participants through the SHC; he recommended using the SHC and stated the SHC had participated in the recruitment of students for various research studies in the past including research on depression and traumatic brain injury. Student recruitment was achieved through personnel in the risk management department of the SHC; the staff compiled a list of 200 students with asthma from the SHC electronic database and sent out an email (Appendix A), crafted by me, to request student volunteers with asthma to contact the researcher directly about voluntary participation in the study. The original email resulted in three students with asthma agreeing to participate in the study. Two weeks after the initial email, a second email was sent from the SHC to the same 200 students with asthma and resulted in recruitment of two more students with asthma bringing the total student participants to five. All five recruited student participants had visited the SHC at least once for treatment and/or care of their asthma prior to participation in the study.

Students (of a variety of ages) with asthma, whether they lived on or off campus, were selected to be participants in this study. All the students recruited personally completed the researcher-provided asthma control test (ACT) and the asthma history forms on their own and forwarded the completed documents to me via email. The email included an attachment with the ACT and the asthma history forms along with the instructions for completing the forms. The completed ACT (Appendix B) and asthma history (Appendix C) forms were given to student participants, and they were instructed to take the forms to their primary care physicians and a copy was retained by me. Five students were chosen to participate based on the inclusion criteria of age (18-60 years), numerical ACT score of 20 or less indicating partially controlled asthma, evidence of self-reported asthma and self-reported doctor prescription of one or more asthma medications per the asthma history form, and a history of at least one visit to the SHC on campus for asthma symptoms. The following could be signs that the student's asthma is partially controlled, with or without medications: (a) partial symptom control, even when the student is taking all his or her medications and following the advice of a healthcare provider, (b) two or more severe asthma attacks per year that require three or more days of systemic corticosteroids (prednisone), (c) one or more trips to the hospital due to asthma attacks over the past year (GINA, 2017). If a student has any one of these signs, his or her primary care physician may refer them to an asthma specialist, like an allergist or pulmonologist. Asthma specialists can help the student get his or her asthma back in control, with the right combination of medications and self-care (GSK Group of Companies, 2017, About Asthma section, para. 12).

Criterion-based sampling was utilized for participants in this study to ensure

information-rich data are collected that meet predetermined criterion characteristics.

Patton (1990) states, “The logic of criterion sampling is to review and study all cases that meet some predetermined criterion of importance” (p. 177). The student participants were selected for this case study based on the following predetermined criteria:

- Gender: male or female
- Ethnicity: all ethnic groups
- Age: (as of date of enrollment in this study)
 - Lower age limit: 18 years
 - Upper age limit: 60 years
- Partially controlled asthma:
 - Asthma Control Test numerical score of less than 20 or item score less than 3 for any of the first four questions regarding symptoms (3-6x /week or more), nighttime awakenings (1 x/week or more), interference with normal activity (at least some of the time), and rescue medication use for symptom relief (2-3x/week or more)
- Self-reported doctor prescription of one or more asthma medications
- At least one visit to the student health center on campus for asthma symptoms
- Completion of at least two long semesters at the university
- Be enrolled as a full-time undergraduate or full-time graduate student at the university
- Able and willing to meet the time and data collection requirements of the study, i.e., participate in a face-to-face interview one hour in length and a

follow up focus group interview of 1 ½ hours in length

The healthcare provider participants were selected for this case study on the following predetermined criterion:

- Gender: male or female
- Ethnicity: All ethnic groups
- Age: (as of date of enrollment in this study)
 - Lower age limit: 26
 - Upper age limit: 70 years
- Be a licensed physician or nurse practitioner for at least two years in the state where the research was conducted
- Be employed at least one year at the SHC university research site
- Involved in the care of students with asthma over the past 12 months
- Able and willing to meet the time and data collection requirements of the study, that is, participate in a face-to-face interview one hour in length and a follow up focus group interview 1 ½ hours in length

Healthcare Provider Participants' Profiles

The five HCP participants recruited were employees of the SHC on the campus of the site where the research was conducted. The HCP participants had on average 10.6 years of experience working in college health. The HCP participants' profiles are displayed in Table 1, which illustrates their gender, years working in college health, and medical education.

Table 1. Profile of the Healthcare Provider Participants		
Gender	Medical Education	Years Working in College Health
Male	Medical Doctor	14
Female	Nurse Practitioner	15
Female	Doctor of Osteopathy	7
Female	Nurse Practitioner	12
Female	Nurse Practitioner	5

Student Participants' Profiles

The five student participants with asthma recruited for this study were all female. This is not surprising considering recent research that reveals adult asthma is more common and more severe among women (Ross, 2018). The student participants' profiles are displayed in Table 2 which illustrates their personal demographics and college level. The names used in the table to describe the participants are pseudonyms.

Table 2. Profile of the Student Participants			
Participant Pseudonym	Age	Gender	Level
Amy	24	Female	Senior
Andrea	22	Female	Junior
Barbara	23	Female	Senior
Jamie	57	Female	Masters
Kat	26	Female	Senior

Each of the student participants shared in the face-to-face interview her journey with asthma. In asthma management, it is important for the individual with asthma to know what triggers his or her asthma. In addition, it is crucial for the individual to be informed of the level of control of his or her asthma as this will influence the type of medication treatment regimen ordered by the physician. Pertinent details of the students' asthma history are displayed in Table 3.

Participant Pseudonym	Age Diagnosed with Asthma	Number of Years Diagnosed with Asthma	How many visits have you made to the Student Health Center during College for Asthma Care
Amy	9	15	4
Andrea	20	2	5-6
Barbara	1	22	5
Jamie	21	36	9
Kat	1	25	7

Participant Pseudonym	The Season of the Year most Troublesome for your Asthma	What Triggers your Asthma?	Self-Reported Asthma Control Test Scores
Amy	Spring	Hot/humid weather, Exercise, Pollen (ragweed, Bermuda grass, St. Augustine grass, oak trees)	14
Andrea	Spring	Animal dander (cats and dogs); Airborne Allergens (cedar trees and pollen)	16
Barbara	Winter and Spring	Cold air, cats, dust, grass, and tree pollens	13
Jamie	Spring and Summer	Mold and pollens; chemical smells, heat and humidity	12
Kat	Fall and Spring	Mold, chemical smells, cigarette and barbecue smoke, humidity	17

Once the participants were selected, each student and HCP was provided with the details of participating in the case study research including the time commitment; date, place, and time for the interviews and focus groups; informed consent; a copy of the interview questions that were asked in the face-to-face interviews; plans for the security and confidentiality of all documents; and review of my account and interpretation of the interview and focus group data (as a member check).

Data Collection

Prior to data collection, approval from the university's IRB was obtained. In addition, I obtained informed consent from each participant and the IRB approved

consent forms were completed (Appendix D, Students; Appendix E, Healthcare Providers). Student participants received a total cash incentive of \$40.00, in the form of two \$20 prepaid gift cards to participate in the face-to-face interview and the focus group interview. Upon completion of the face-to-face interview the student received the first of two, \$20.00 cards with the other \$20.00 gift card being awarded after completion of the focus group interview.

Data collection for this case study included: (1) in-depth, semi-structured face-to-face interviews, varying between 45 minutes to 60 minutes in length, per participant; (2) document collection, to establish the context of asthma care at the SHC; (3) focus group interviews, 1-hour session with four of the healthcare providers and a separate 1-hour, 20 minute session with three college students; and (4) researcher's journal which included notes taken during the face-to-face and focus group interviews, observations of the SHC and university environment, and a chronicle of the steps of the research process (face-to-face and focus group interviews).

ELT emphasizes that learning is a process whereby knowledge is created through transformation of experience (Kolb, 2015). According to ELT, students with asthma will gain knowledge of how to better manage their disease through the process of adaptation and learning. Through my data collection, I learned about the students' perspectives and insights into how they adapt and learn about their asthma during the college years. By asking good questions in the face-to-face interviews and the focus group interviews, I discovered how asthmatic students make meaning of their experiences of living with asthma on the college campus and how the healthcare providers make meaning from their lived experiences of caring for asthmatic students. Using all my data collection

techniques, I connected the lived experiences of the students with asthma to ELT's learning cycle, which includes concrete experience (experiencing), reflective observation (reflecting), and abstract conceptualization (thinking) and active experimentation (acting). According to Kolb (2015), knowledge is created when the learner takes in information and transforms or interprets the information and acts on it thus completing the idealized learning cycle of experiencing, reflecting, thinking, and acting.

Individual Interviews

The in-depth interview has been routinely used in various types of qualitative research to obtain rich data during a directed conversation with the participant (Charmaz, 2006). The goal of asking in-depth questions is to elicit each participant's interpretation of his or her experience, and the interviewer asks questions in a way to encourage a response from the participant. Even though the interview process is a two-way conversation, the interviewer must primarily listen and observe, thereby allowing the participant to do most of the talking (Charmaz, 2006). Unlike an ordinary conversation, the interviewer is expected to dig beneath the surface of the conversation by asking for more details or an explanation of a topic or statement made by the participant (Charmaz, 2006). The versatility of the in-depth interviews is found in the ability of the interviewer to slow or quicken the pace as needed, restate the participant's point to check for accuracy, and keep the participant on the subject (Charmaz, 2006). For this case study, I utilized face-to-face, in-depth, semi-structured interviews (Appendix G: Healthcare provider interview protocol; Appendix H: Student interview protocol), approximately 45 minutes to 60 minutes in length, to obtain the rich qualitative data needed to aid in answering my research questions.

Documents

Documents were collected as an additional source of data for this case study. In qualitative research methods it is recommended that the researcher uses multiple sources of evidence thereby triangulating the data (Bowen, 2009). Triangulation safeguards the data from researcher bias, the one-sidedness of a single source of evidence, or falsely presenting the data (Patton, 1990). Furthermore, triangulation is confirmation the researcher has demonstrated the data are supported by multiple sources of evidence (Yin, 2014). The documents collected were examined and interpreted to “elicit meaning, gain understanding and develop empirical knowledge of the case” (Bowen, 2009, p. 27). A document may be characterized as, “texts (words) and images that have been recorded without a researcher’s intervention” (Bowen, 2009, p. 27). The documents I collected for this case study included the following from the SHC staff or the website: asthma action plan, the impact statement from the academic year 2016-2017 (Appendix H), asthma history form, asthma education literature from the electronic medical record, and a written asthma education brochure. For clarification, the impact statement is an annual report published by the SHC which consists of student demographic data and information regarding topics such as patient satisfaction surveys, number of patient visits, and health care related resources available for students. In addition, the SHC participates in outreach on campus in the form of presentations on health-related topics such as managing stress in college, destigmatizing mental health, and alcohol bystander intervention training to student groups/organizations and residence halls. The ACT and the asthma history forms were the two researcher-provided documents for this study. The student participants completed the ACT and the asthma history forms individually and returned them me via

email. These documents were important data for this case study in that they aided me in establishing the method used to identify students with asthma on campus, how students are made aware of the available asthma resources at the SHC, what types of asthma education material are available at the SHC and to develop the context for asthma care at the SHC.

Researcher's Journal

A researcher's journal was another source of data for this case study. According to Lindlof and Taylor (2011), a journal may be utilized by the researcher to manage the dates and times of the people who were interviewed, as well as notes recorded during the interviews. The researcher's journal may also reveal problems encountered during data collection thereby giving the researcher time to reflect and find ways to unravel them (Lindlof & Taylor, 2011). Another aspect of the researcher's journal is to use the notes to "enhance collaboration with your participants via member checks of the emerging findings of your project" (p. 163). The researcher's journal may also act as an outlet to record the goals and procedures for conducting the study (Lindlof & Taylor, 2011). I utilized the researcher's journal as a practical data collection tool which allowed me to enhance collaboration with the participants and reflect on the accuracy of the data. Immediately after each interview of both groups of participants, I reorganized my notes taken during the interview by typing the notes in a word document. In addition, I utilized an outline to capture important data from the participants while it was fresh on my mind.

My researcher's journal contains the following components: (a) environment on campus where the interviews were conducted. For example, each student interview was conducted in the graduate student study room in the library and the HCPs' interviews

were conducted in their personal offices at the SHC, (b) description of the participant. For example, student participant Amy was described as a Caucasian, 24 years of age, and who lives off campus; she is a senior majoring in Psychology, (c) description of what went well. For example, Amy was cooperative, friendly, and answered all the questions I asked of her. Furthermore, the graduate student study room was comfortable and provided privacy for the interviews due to its location in a corner area of the library, (d) a global view of the interviews. Example of this component includes the following: Amy states her challenges on campus are the many stairs and high heat and humidity levels, (e) critical events regarding the participants. Examples of critical events include: Amy is prescribed three daily medications to treat her asthma and she is dependent on her mom and dad to help manage her asthma from a distance. Her mom texts her every day including the local temperature, grass and tree pollen count so she may be aware of potential asthma triggers for that day.

Focus Group Interviews

Patton states, “A focus group interview is an interview with a small group of people on a specific topic” (Patton, 2002, p. 385). The focus group interview was developed in the 1950s as a method to study the consumer decision making process in a social context (Patton, 2002). It was reasoned by market researchers that consumer decisions are made in a social context (Patton, 2002). According to Breen (2006), the purpose of the focus group interview is the generation of new ideas that are formed in a social context. And, unlike the one-on-one interview the participants are present to hear the responses of the other participants to the questions being asked and offer their comments as they listen to the ongoing conversation (Patton, 2002). Patton also lists

some of the things a focus group interview is not; “it is not a problem-solving session, nor is it a decision-making session, it is an interview” (p. 386). The primary focus is to provide a venue where high-quality data are obtained in a social context and participants can consider their own views in the context of others’ views (Patton, 2002). The focus group interview (Appendix I: Focus group interview guide outline) was utilized for this study to explore the perceptions and attitudes of students with asthma regarding challenges in self-managing their asthma during their college years and the perceptions of the HCPs at the SHC regarding the current state of asthma education and management on the campus. The student focus group interview (Appendix J: Student focus group interview questions) was conducted after all the face-to-face interviews, followed by the healthcare providers’ focus group interview (Appendix K: Healthcare provider focus group interview questions). I served as the moderator for both focus group interviews.

Data Analysis

The act of data collection and analysis are not two separate functions; they are performed simultaneously to facilitate the engagement and the development of categories (Charmaz, 2006). Data collected for this case study including face-to-face interviews, focus group interviews, documents, and the researcher’s journal underwent qualitative coding as proposed by Charmaz (2006). Charmaz’s qualitative coding is rooted in grounded theory which consists of two main phases: (1) initial coding, and (2) focused coding. Charmaz also refers to Strauss and Corbin’s (1998) axial coding as the step in the analysis that follows focused coding (Charmaz, 2006). Coding allows the qualitative researcher to define what is happening in the data and to start the process of finding meaning. Through closely reading the data, I was able to find out more about the

participants' lives and the social context of what was happening (Charmaz, 2006).

The goal of initial coding is, "to perform a close reading of the data, line by line, while remaining open to all possible theoretical directions" (Charmaz, 2006, p. 46).

Focused coding allowed me to isolate and develop important categories from the enormous amounts of data. According to Charmaz, "through comparing data to data, we develop the focused code" (p. 60). Axial coding was my next phase of coding where the data were reassembled from being taken apart during the first two phases of coding (Charmaz, 2006). Strauss and Corbin (1998) state that axial coding brings the data back together to form a coherent whole. Axial coding assists the researcher to, "answer questions such as when, where, why, who, how, and with what consequences" (Strauss & Corbin, 1998, p. 125). Qualitative codes, "take segments of data apart, name them in concise terms, and propose an analytic handle to develop abstract ideas for interpreting each segment of data" (Charmaz, 2006, p. 45).

For this study, the steps for coding of the data were as follows: (1) initial coding, (2) focused coding, and (3) axial coding. Once the codes emerged and they were assembled into categories, I engaged in the constant comparative method of data analysis developed by Glaser and Strauss (1967). According to Glaser and Strauss, the constant comparative method is utilized to generate categories, properties, and hypotheses about general problems. Some of the properties found with the emerging categories may be conditions, consequences, dimensions, types, processes, etc. The constant comparative method may be applied to any type of qualitative information such as documents, interviews, observations, and artifacts (Glaser & Strauss, 1967). This analysis method includes the following: comparing incidents applicable to each category – the codes that

emerge from systematic coding (initial, focused, and axial) are compared to the incidents (occurrences or happenings) of the emerging categories. The constant comparison units utilized are comparing incident with incident within each category. For example, one of the categories that arose from systematic coding of the student data was, “surviving asthma.” Within this category was an “incident” derived from the emerging data, “I don’t want to spend my money on like an inhaler or a doctor’s appointment,” so “surviving asthma” is derived from this data coded (axial codes) as “avoiding the doctor” and “not paying for medications.” And linked to this incident was another incident within the same category of “surviving asthma.” The other incidents were derived from additional groups of emerging student data, namely, “I ignored my asthma a lot when I got to college” and “It got bad enough to where I had to start doing something about it” that were derived from systematic coding. The rule for this stage is, “while coding an incident for a category, compare it with the previous incidents in the same and different groups coded in the same category” (Glaser & Strauss, 1967, p. 106). Using the example of the category, “surviving asthma,” as the data were collected and analyzed from the interviews, the incidents “avoiding the doctor” and “I ignored my asthma a lot when I got to college,” are good examples of two incidents coded from different groups but in the same category of “surviving asthma.” As the coding continues the constant comparative units change from comparison of incident with incident to comparison of incident with properties (i.e., conditions or consequences) of the category that resulted from initial comparisons of incidents. Therefore, a particular category may become integrated with other categories. In keeping with the same example above, I compared the incident “avoiding the doctor,” with the property that asthmatic students predict they can save

money by not going to the doctor. And, as I noted when analyzing the data as the student predicts saving more money with each incident of avoiding the doctor or refusing to pay for asthma medications, I found the most influential factor in a student “saving money” was his or her worsening asthma symptoms, which resulted in breathing difficulty. This example of constant comparison shows that the property (student predicts saving money) is an integrated element of the category “surviving asthma.”

After coding and constant comparative analyses were completed, a final theoretical analysis was conducted to identify instances of the following: experiencing, reflecting, thinking, and acting in participants’ learning processes. In this final step of analysis, I searched for themes regarding personal and social knowledge and analyzed the data for affective, perceptual, symbolic, and behavioral symbols in participant experiences in an effort to interpret meaning making of learning about and living with asthma on this college campus.

Connecting the Theoretical Framework

The idea that asthmatic students and healthcare providers learn from their experiences is supported by the experiential learning theory (ELT). ELT, as proposed by David Kolb, is the lens with which I structured my study to document how students with asthma and healthcare providers learn from their experiences about asthma. In accordance with the ELT, it is my belief both groups of participants in this study demonstrated gains in knowledge of asthma management through the process of adaptation and learning through a grasping and transforming experience. One student example is Amy; she learned from experience that increased outdoor air temperature levels cause issues with her breathing. So, she monitors the ambient daily temperature in

preparation to avoid overheating her body, which she says will trigger breathing difficulty. ELT holds that, “learning is a process whereby concepts are derived from and continuously modified by experience” (Kolb, 2015, p. 37). Amy continuously modifies the clothing she wears each day to adapt to the air temperature to avoid overheating her body. ELT further states that knowledge is created through the transformation of experience, and it results from the combination of grasping experience and transforming experience (Kolb, 2015).

Kolb’s experiential learning cycle consists of two dialectically related modes of grasping experience: concrete experience (experiencing) and abstract conceptualization (reflecting) and two dialectically related modes of transforming experience: reflective observation (thinking) and active experimentation (acting) (Kolb, 2015). This learning cycle is an idealized process whereby, “the learner integrates each of the four modes: experiencing, reflecting, thinking, and acting in a repetitive process that is sensitive to the learning situation and what is being learned” (p. 51). An explanation of the four basic learning modes of concrete experience, reflective observation, abstract conceptualization, and active experimentation will be described next along with study data that serve as examples of each mode of learning.

After my inductive coding analysis, I then searched the data to identify examples of Kolb’s (2015) four basic learning modes. Concrete experience emphasizes experiences that focus on feeling rather than thinking. In this mode people are concerned with human situations and are proficient at relating to others. This mode involves an “artistic” approach in contrast to a systematic, scientific approach to problems (Kolb, 2015). An example of an HCP participant from this study that exemplifies this mode of learning is

Lilly. Through interacting with her during the interview and from documented student comments, she is concerned with human situations and is proficient at relating to others.

Her comment epitomizes the concrete experience,

So, I'm very, very committed to all things that are prevention related. And so, if I could save somebody a trip to the ER or save them from developing cancer or death for any reason, I want them to have a long and happy and healthy life and be all they can be.

Lilly's quote truly represents a concrete experience regarding learning about asthma. She is acutely aware of the possibility an asthmatic student may experience a life-threatening asthma flare-up, but she is always thinking of the student's well-being. This also dovetails with Kolb's (2015) imagining style of learning which is characterized by "the ability to imagine possibilities by observing and reflecting on experiences" (p. 145). By imagining and reflecting on the possibilities of keeping asthmatic students out of the ER or prevention of death, Lilly is learning to effectively manage students with asthma.

Reflective observation orientation focuses on seeking to understand a particular situation instead of practical application. Individuals who adhere to this mode of learning are good at looking at different perspectives and appreciating the viewpoints of others. People advocating this orientation value patience, impartiality, and thoughtful judgment (Kolb, 2015). Gabrielle, one of the HCPs, displays characteristics of this mode of learning. Gabrielle is very good at considering the perspective of the asthmatic student; she explains,

They [asthmatic students] have so much to offer us and themselves. We're not telling their body anything new, but this gap between they don't understand

what's going on [with their asthma] and if they could get not just the understanding . . . that's driving the machine kind of thing....like oh, I'm here, but I could also be effective at reducing my symptoms instead of just the victim of my symptoms.

Gabrielle's quote represents the reflecting style of learning in which she is describing how an asthmatic student's lack of understanding about the science of what is happening in his/her lungs and subsequently how to reduce asthma symptoms leads the student to see herself as a victim. This is a thoughtful reflection by Gabrielle in which she takes on the viewpoint of the asthmatic student and reflects on how the student may view herself as a victim. Through this process of reflection, Gabrielle can incorporate her knowledge about asthmatic students to teach him or her to focus on gaining knowledge of his/her asthma thereby leading to a better understanding of the disease.

Abstract conceptualization orientation emphasizes thinking as opposed to feeling. An individual that favors this mode of learning uses logic, ideas, and concepts; they are concerned with building theories. In tackling problems, individuals with this orientation are good at systematic planning, manipulation of abstract symbols, and quantitative analysis (Kolb, 2015). This mode of learning is exemplified by the student participant Kat. She is a very analytical person who seemed to be active in tackling her asthma problem head-on and building theories in the form of developing "types of asthma" based on her lived experiences; she explains,

I feel there's different types of asthma I get, and so I'd say the most dramatic classic one I call it the wet asthma. Then there's the dry tight one, which I think is like that's the one that is less dramatic, creeps up but is the worst and the hardest

to treat. The other kind of asthma is like I'll feel really intense or sharp or dull pain in certain spots, and I used to not know that was asthma.

Kat's quote represents systematic planning and the building of theories which are characteristic of the abstract conceptualization mode of learning (Kolb, 2015). This approach by Kat merges with the thinking and deciding styles of learning which are characterized by, "disciplined logical reasoning and the use of theories to decide on problem solutions and courses of action" (Kolb, 2015, p. 145). Kat's development of "types of asthma" are a good examples of theory building.

Active experimentation orientation emphasizes doing rather than thinking. This mode of learning focuses on actively influencing people and achieving results.

Individuals who align themselves with this orientation are good at accomplishing things and are willing to take risks to achieve their objectives (Kolb, 2015). The study HCP participant I feel is represented by this mode of learning is Bill; he shares his approach,

My primary concern is to make sure we reverse the situation and get them out of any potential danger zones, get them feeling better and therefore being more able to complete the studies that they're here to do in the first place. And, getting them back to the activities they want to do, as soon as possible.

This quote of Bill represents the acting style of learning which is characterized by "a strong motivation for goal directed action" (Kolb, 2015, p. 145). Bill seems to be disciplined in figuring out the asthmatic student's situation and coming up with a plan of action. He is dedicated to diagnosing the problem and getting asthmatic students well and back to their studies and all their other normal activities.

I then looked for examples in the data that exemplified when participants described the full cycle of Kolb's model. Kolb's explains that the four modes of learning are not mutually exclusive and assemble to create a learning cycle that incorporates all four modes in a continuous spiral of learning (Kolb, 2015).

Based on the findings of this study the asthmatic students displayed signs of adapting and learning from their experiences of how to self-manage and cope with their asthma amid the everyday challenges and stressors of college life. Here, I present three student participant examples from this study of learning from experience to survive asthma. The students utilized the combination of grasping experience and transforming experience whereby they took in information, reflected on the meaning of the information, then interpreted the information for their own lives, and then acted on that information to better manage their illnesses. Amy learned from experience to cope with high outdoor air temperatures; she states, "I try not to wear a lot of clothes, so my body doesn't get too hot, 'cause if I get too hot then it'll mess with my chest." Another student, Barbara, explains, "I'm becoming a little more educated on what I'm taking [asthma medications]. All of my education [regarding asthma medication adverse effects] is from experience." Kat shares how she adapts, "I take care of my asthma and making notes of things as I go along from experience." These three students' efforts to survive asthma on the college campus was dependent on their ability to adapt not only in a reactionary way of dealing with the physical world but in a proactive creative way to shape their lives (choices, behaviors, learning) within this world (Kolb, 2015). Amy took in the information (hot air temperature), reflected on that information, interpreted it to cause issues with her breathing, and acted to dress appropriately to avoid overheating her body.

Analysis of the data through this ELT cycle helps us to see how students' understandings of how to survive with asthma are being formed and reformed through their daily experiences (Kolb, 2015).

Regarding the HCPs, they too shared how they have learned from experience to treat and manage students with asthma. Bill explains, "I learned a little about asthma during medical school and mostly in residency [clinical training] for family practice." And similarly, Gabrielle comments, "I guess initially in my residency program [clinical training], but truthfully by practicing medicine." Debbie relates how learning by experience is occurring for her, "I think that with practice, you start learning what is going to work [in managing students with asthma]." It is documented in this study all the HCPs were trained through a formal educational medical curriculum about asthma management; however, the three examples given here of Bill, Gabrielle, and Debbie show learning by experience in treating asthmatic students is happening daily. According to ELT, "learning is the process whereby knowledge is created through the transformation of experience" (Kolb, 2015, p. 49). Even though the HCPs all completed a formal medical program with clinical training, their actual experience in treating and managing asthmatic students has resulted in learning from the transformation of this experience. Each HCP encounter with an asthmatic student at the SHC is a potential learning situation whereby the HCP takes in information about a student's asthma, reflects on that information, interprets it, and acts by developing an asthma action plan. As with the students' ideas of how to survive asthma, the HCPs' ideas of how to manage asthmatic students are being formed and reformed through their daily experience of

interviewing, examining, assessing, treating, and managing asthmatic students who seek help for their asthma at the SHC on campus.

Through analysis of the data, I learned about the students' and HCPs' perspectives and insights into how they adapt and learn about asthma. By asking good questions in the face-to-face interviews and the focus group interviews I discovered how asthmatic students make meaning of their experiences of living with asthma on the college campus and how the healthcare providers make meaning from their lived experiences of caring for asthmatic students. Using the analysis of the data, I connected the lived experiences of the asthmatic students and the HCPs to ELT's learning cycle, which includes experiencing, reflecting, thinking, and acting.

In summary, the data analysis for this case study consisted of the following steps:

- (1) Initial coding (Charmaz, 2006)
- (2) Focused coding (Charmaz, 2006)
- (3) Axial coding (Charmaz, 2006)
- (4) Constant Comparative Method (Glaser & Strauss, 1967) consisting of:
 - Comparing incidents applicable to each category
 - Integrating categories and their properties
- (5) Final analysis: identify instances of experiencing, reflecting, thinking, and acting in participants' learning processes (Kolb, 2015)

Conducting Research Ethically

Researchers have a responsibility to conduct research studies that produce accurate, reliable, and credible results (Yin, 2014). Specific ethical considerations invariably come to the surface when conducting studies involving human subjects. To

maintain the highest ethical standards, I protected the human subjects in my study by utilizing pseudonyms and de-identifying all data files and securing private information of all media formats in password protected electronic files and locked storage of hard copies. I also followed the National Research Council (2013) suggestions when conducting research with human subjects:

- gaining informed consent from all persons who were part of my study;
- protecting those who participated in my study from any harm, including avoiding the use of any deception in my study;
- protecting the privacy and confidentiality of those who participated in my study; and,
- sought participants equitably, so that no groups of people were unfairly included or excluded from the research. (p. 63-64)

Regarding the last bullet point, “sought participants equitably,”; my study required a criterion-based sample of students who had been diagnosed with asthma. Since all my student participants were female it seems as though I did not adhere to the National Research Council (2013) suggestions for conducting research with human subjects. However, all the students who responded to my two email requests (approximately 20) expressing an interest in volunteering for the study were all female except for one male student. I do not have a real explanation for this finding; I cannot speak for the adult males with asthma on this campus and their reasons as to why they would not commit to volunteering for this study. In addition, there is a gender gap in asthma which reveals, “after puberty, asthma becomes about 40 percent more prevalent and severe in women, and women older than 15 are 2.3 times more likely than males to

be admitted to the hospital for asthma” (Ross, 2018, p. 21). In addition, a study by Flores, Bandoli, Chambers, Schatz, and Palmsten (2019) states that, “after age 17 through childbearing age, asthma prevalence is more common among women than men” (Introduction section, para. 2). The research shows that adult asthma is more common among women and this may, at least partially, answer why all my student participants were female.

Trustworthiness

Case study research is a legitimate part of the larger body of qualitative research. As such, the research design of a case study should include logical tests so that the quality of the research study may be confirmed (Yin, 2014). As previously mentioned, there are four logical tests that the researcher should apply when designing his/her research study to ensure quality, they are: construct validity, internal validity, external validity, and reliability. Next, I provide the specifics as to how I ensured the trustworthiness of my case study.

Construct validity. To ensure construct validity, I incorporated the following in my case study: multiple sources of evidence and review of my case study by key informants. I utilized multiple sources of evidence during data collection to including, face-to-face interviews, focus group interviews, document collecting, and a researcher’s journal. I achieved my goal, as the researcher, of presenting enough evidence to convince and gain the confidence of the reader that I have a command of the subject matter (Yin, 2014). For the second tactic used to ensure construct validity, I had my case study draft reviewed by key informants (Yin, 2014). Key informants included one of my colleagues in the respiratory care department and my dissertation committee members who reviewed

the content of my case study.

A member check process was conducted utilizing the approach developed for a health research study by Birt, Scott, Cavers, Campbell, and Walter (2016), which consisted of returning individualized member check documents containing synthesized analyzed data to the participants allowing them the opportunity to provide comments and make any changes to the data. An initial email was sent to all participants requesting their participation in the member check process. In the email, I informed them of the member check process and provided an explanation of how the process would be conducted. The participants were directed in the email to read the document I had attached and comment on whether or not they felt the synthesized results resonated with their experiences and if there were anything they would like to change. The participants were asked to email the member check document back to me with their comments and any changes they would like to have completed, and my analysis of the data was revised to include the participants' changes. If the participants had any questions or concerns, they were encouraged to contact me. I included my contact information, phone number and email address, in the email request.

Internal validity. Internal validity of a case study may be threatened by the overall problem of making inferences (Yin, 2014). For example, a researcher may infer that a particular event resulted from some earlier occurrence based on an interview collected as part of the case study. To ensure the internal validity of my case study I utilized two approaches: (1) methodological triangulation, which involves the use of multiple analysis methods (Glaser & Strauss, 1967), and (2) pattern matching, which involves comparing a predicted pattern prior to data collection to an empirical pattern

(Yin, 2014). For example, in my case study the predicted pattern prior to data collection was as follows, “I predict college students with asthma will demonstrate a lack of knowledge regarding the proper use of a metered dose inhaler”. Furthermore, the empirical pattern is evidenced by the occasion during the face-to-face interviews with the student participants when I asked each person if they had been instructed in the past to always use a holding chamber when delivering asthma medications with their metered dose inhaler and each student answered no. Based on this finding, the concept of using a holding chamber with their metered dose inhaler for medication delivery was introduced and I gave each student a new holding chamber and taught her how to properly administer asthma medications with a metered dose inhaler and holding chamber. Therefore, since the predicted pattern was similar with the empirical pattern the results help to strengthen the internal validity of this case study.

External validity. External validity has to do with the generalization of the study findings (Yin, 2014). While qualitative research does not endeavor to generalize findings across all contexts, I provided substantive description of the research context and offer findings well-substantiated by participant voices (data) in the report of the research so that readers may judge for themselves the appropriate level of transfer into their own contexts. As well, in striving for external validity in a case study the forming of appropriate research questions aided in the generalization of my study findings. Yin (2014) states that during the research design of the case study the researcher should focus on forming “how” or “why” questions to directly influence the external validity of the study. To strive for external validity, my study design was augmented by the creation of three “how” questions: (1) How do undergraduate and graduate students with asthma

learn from their experiences in the self-management of their asthma during their college years?, (2) How do these students cope with their asthma on the college campus?, and, (3) How do healthcare providers at the SHC on campus perceive the current state of education and management of asthma for college students with this chronic disease?

Reliability. The reliability of a research study is confirmed by the replication of the study by another researcher. Reliability may be ensured using a case study protocol (Yin, 2014). I ensured the reliability of my case study by utilizing a case study protocol. The sections of my case study protocol included:

- Overview of the case study: the research problem and the purpose of the study, and the topic being investigated, i.e., asthma on the college campus.
- Data collection procedures: in-depth face-to-face interviews, document collecting, researcher's journal, and focus group interviews.
- Data collection questions: these would include sample questions for the in-depth face-to-face interviews and focus group interviews.

Conclusion

This case study provided insight into how college students with asthma learn from their experiences during their college years to self-manage their asthma on a college campus. In addition, this study provided knowledge about the perceptions of healthcare providers at the SHC regarding the current state of education and management of asthma on the campus. To gain knowledge about the topic of asthma on the college campus, the following questions guided my research: (1) How do college students with asthma learn from their experiences in the self-management of their asthma during their college years? (2) How do college students cope with their asthma on the college campus? and, (3) How

do healthcare providers at the student health center on campus perceive the current state of asthma education and management of college students?

The study participants I chose consisted of two groups: college students with partially controlled asthma and HCPs employed at the SHC. Regarding college students with asthma, I purposely chose students with partially controlled asthma. The students with partially controlled asthma who volunteered for this study had at least one doctor prescribed asthma medication, had visited the SHC on campus at least once for asthma care prior to the study, and had experienced at least one asthma flare-up during their college years. I did not utilize any student enrolled in the respiratory care program at the university research site as participants in this study. Since I am a faculty member teaching in the respiratory care department at the research site, I did not want to use respiratory care students (who have an asthma diagnosis) as participants in this study due to my current familiarity with, and to a possible conflict of interest for this group of students.

Regarding the HCP participants, these are the individuals who have direct interactions with the college students for care and treatment of their asthma. These physicians and nurse practitioners at the SHC were chosen as participants because they are charged with obtaining patient history of asthma from the students, performing physical assessment of asthma symptoms, writing prescriptions for asthma medications, educating students about asthma, and establishing follow-up appointments. Furthermore, these HCPs assisted me in understanding the full scope of the case.

IV. FINDINGS

This chapter documents the attitudes and perceptions of college students with asthma as well as the perceptions of the HCPs employed at the SHC regarding the status of asthma education and management on campus. Through one-on-one interviews and separate focus group interviews with students and HCPs, the research questions were addressed utilizing a qualitative instrumental case study design approach. The university campus and the student health center on campus formed the real-world context for this study thereby creating the optimal environment for a case study approach. The purpose of this qualitative case study was to examine how college students learn from their experiences to self-manage their asthma during their college years and to examine the perceptions of healthcare providers regarding the current state of asthma education and management on campus. As previously stated, the research questions investigated for this study were:

- How do undergraduate and graduate students with asthma learn from their experiences in the self-management of their asthma during their college years?
- How do college students cope with their asthma on campus?
- How do HCPs at the SHC perceive the current state of asthma education and management of college students on the campus?

The theoretical framework for this study is David Kolb's, "Experiential Learning Theory" (ELT). The premise of ELT is an individual learns by creating knowledge through transformation of experience; it holds that learning may be described as a process of adaptation to the world (Kolb, 2015). According to Kolb (2015), learning is an eclectic activity which integrates the functioning of the total human body – thinking, feeling,

perceiving, and behaving.

Through the narratives of students with asthma enrolled at the university where the research was conducted, it was my hope to discover if students' lived experiences with asthma helped them to learn to self-manage and cope with their asthma while in college. In addition, I was interested if students were adapting their lives based on their learning experiences with asthma on the college campus. Furthermore, I wanted to assess how the HCPs employed at the SHC viewed the current state of asthma management and education on campus. Are the HCPs satisfied with the current state of asthma care for the students on campus? What do the HCPs feel is needed to improve the asthma care of students? The following sections are divided into Part I, Part II, and Part III. Part I will address the first two research questions which are focused on students with asthma and how they learn about asthma and how they are coping with asthma on the college campus. Part II addresses the third research question which focuses on the HCPs employed at the SHC and their perception of the status of asthma education and management on the campus. And, Part III is the conclusion.

Part I: College Students Learning About and Coping With Asthma

In this section of the chapter I will focus on answering the first two research questions: (a) How do undergraduate and graduate students with asthma learn from their experiences in the self-management of their asthma during their college years, and (b) How do college students cope with their asthma on the campus? Firstly, I will introduce the five student participants and share their profiles and personal stories of living with asthma on the college campus.

The “Asthma Journey”: Student Profiles

The student participants in this study have been diagnosed with asthma by a physician at some point in their lives, some earlier in their lives than others. These volunteer participants are all female full-time college students, four undergraduates and one graduate student. The student participants were enrolled for at least two long semesters, at a large public university located in the southwest region of the United States, prior to participating in this study. The students were recruited through the SHC on campus since they all had visited the SHC for asthma care prior to volunteering for this study. In addition, all the student participants were able and willing to meet the time and data collection requirements of the face-to-face interviews, and three of the five students were able to meet the time and data collection requirements for the follow-up focus group interview on campus.

Prior to being interviewed, each student participant completed the Asthma Control Test (ACT) form, a validated instrument of five questions used to determine a numerical score which indicates the student’s level of asthma symptom control. An ACT score of less than 20, which indicates partially controlled asthma, was utilized as part of the student participant selection criteria. During the face-to-face interviews, I asked the students at which age they were diagnosed with asthma; therefore, I was able to determine how long they have lived with asthma. In addition, I inquired of the students their most troublesome season of the year regarding asthma flare-ups. The most “troublesome season” describes the time of year (season) the student’s asthma flare-ups require more than usual care to get their asthma under control. The “more than usual care” could vary from one student to another, for example, a student may treat an asthma

flare-up with repeated doses of an asthma rescue inhaler, such as Albuterol. Or the student might visit the SHC on campus (or a local urgent care clinic or hospital emergency department) to be seen by an HCP for asthma care and treatment. The “troublesome season” varied somewhat with each student depending on what triggers an asthma flare-up and the severity of the asthma symptoms. The asthma triggers for the students varied from environmental weather conditions (hot and humid), airborne allergens (tree pollens and grass pollens), and some that were not influenced by the seasons of the year including animal dander, dust, exercise, and chemical smells (perfume and cologne). As I reviewed each student’s asthma medication list (self-reported on their completed asthma history form) and asked questions, I learned the students were deficient in knowledge of the benefits and risks of their asthma medications. In addition, they were lacking the appropriate training and skills in the proper administration of these medications to the lungs. I will now share the “asthma journey” for each student participant; the names used for each student are pseudonyms.

Amy. She is a 24-year-old undergraduate student who was diagnosed with asthma at the age of 9 years. At the university she is classified as a senior and her academic major is Psychology. She has lived with asthma for 15 years and states her most troublesome season of the year for her asthma is spring. Amy’s self-reported ACT score was 14. Her asthma triggers include hot and humid weather conditions, exercise, and airborne grass pollens and tree pollens including Ragweed, Bermuda grass, St. Augustine grass, and Oak trees. She stated during her interview over the last year she has sought treatment for her asthma symptoms four times at the SHC on campus. When asked to share her experiences for asthma treatment at the SHC she commented, “I feel like they're

limited, like I know she [HCP at the SHC] doesn't specialize in asthma, so I just don't feel like she 100 percent knows what's going on." Furthermore, Amy prefers her hometown asthma specialist (Allergist) to manage her asthma. Upon review of the critical events of my researcher's journal regarding Amy reveals three medications prescribed daily by her doctor to treat symptoms of her asthma including ProAir inhaler (Albuterol), QVAR inhaler (corticosteroid), and Singulair (asthma and allergy medication). At 24 years of age she depends on her mom to text her air quality information each day regarding airborne allergens and weather conditions that trigger her asthma. In addition, she consults with her dad who works in a hospital about her asthma (he obtains advice from coworkers in the hospital about her asthma management). These interactions with her parents signal she remains somewhat dependent on her parents to assist with her asthma management during her college years.

Andrea. She is a 22-year-old undergraduate student who was diagnosed with asthma at the age of 20 years. At the university she is classified as a junior and her academic major is Nutrition. Andrea is an emerging adult, meaning, she is transitioning to an adult role by taking on responsibility for her asthma. She states, "I never had my parents to be like hey take your medication. You sound like you need your inhaler. It was all up to me from the beginning." And from the beginning of her asthma diagnosis she started her transition to independence from her parents regarding managing her own health care. She has lived with asthma for 2 years and states her most troublesome season of the year regarding her asthma is spring. Andrea's self-reported ACT score was 16. Her asthma triggers include animal dander (cats and dogs), and airborne allergens (cedar trees and grass pollen). When asked how many times she has visited the SHC during the last

year for asthma related issues she stated, “I’d say at least like five or six times.” When asked about her perception of the SHC when she has visited for an asthma treatment she stated, “I think they’re really helpful. They kinda guide me to follow my normal prescriptions I have.” However, she prefers her asthma to be managed by her hometown asthma specialist, an Allergist. She likes the relationship established over the past two years with the Allergist. Upon review of the critical events of my researcher’s journal Andrea states her asthma flare-ups disturb her sleep and cause her to wake up short of breath. She has been prescribed three daily medications to treat her asthma symptoms including ProAir inhaler (Albuterol), Symbicort inhaler (combination corticosteroid and long-acting bronchodilator) prescribed two puffs twice a day, and Singulair (asthma and allergy medication) taken once each day at bedtime.

Barbara. She is a 23-year-old undergraduate student who was diagnosed with asthma at the age of 1 year. At the university she is classified as a senior and her academic major is Microbiology. She describes her lived experience being diagnosed with asthma very early on in life:

I would take treatments all the time to where I was just really shaky, and I think that’s what led to me not liking my asthma medicine . . . when I got to college, I ignored my asthma a lot.

She has been living with asthma for 22 years and comments her most troublesome seasons of the year for her asthma are winter and spring. Barbara’s self-reported ACT score was 13. Her asthma triggers consist of cold air, cat dander, grass pollen and tree pollen, and dust. She does have a pet dog but reports no issue with her asthma related to being around her dog. When asked how many times she has visited the SHC for asthma

related issues she stated, “This past school year I've been four times.” Barbara’s experiences at the SHC have been positive, she comments, “I was surprised at how thorough they were . . . they showed a lot of concern and basically covered all the bases.” However, she prefers to be treated by her hometown asthma specialist, an Allergist. Since she has been in college she uses the SHC on campus mainly due to the lack of medical insurance coverage and the affordability of the care. Upon review of Barbara’s critical events documented in my researcher’s journal she states her mom has asthma and her mom remains involved with her asthma care (mainly consulting with her over the phone about asthma medications, the daily airborne allergens, and money to pay for medications and sick visits to the SHC). Her mom chose not to renew her medical insurance coverage due to the expense of paying the premiums; this left Barbara without medical insurance coverage. Barbara comments on a time when her rescue inhaler was empty, so she borrowed a rescue inhaler from a friend due to the lack of money and medical insurance coverage. Her asthma medications consist of a Ventolin inhaler (Albuterol), an Advair Diskus dry powder inhaler (combination corticosteroid and long-acting bronchodilator medication), which was provided free to her from the pharmacy at the SHC, and Singulair. She stopped using Singulair because the expense of the medication was excessive without medical insurance coverage. She stated she is concerned about asthma medication (corticosteroids) side effects and admits to having trouble sleeping when her asthma flares up.

Jamie. She is a 57-year-old graduate student who was diagnosed with asthma at age 21 years. She was diagnosed with asthma from working in a production plant with chemicals and no ventilation and recently she was diagnosed with Chronic Obstructive

Pulmonary Disease (COPD). At the university she is a graduate student working toward a master's degree in history. She has lived 36 years with asthma and her most troublesome seasons of the year are spring and summer. Jamie's self-reported ACT score was 12. She states her asthma triggers consist of mold and airborne grass and tree pollen, chemical smells (perfume and cologne), and high heat and humidity levels. She lives off campus, about 30 miles from the university, and commutes by car to the campus; walking long distances to class is a challenge for her so she obtained a handicapped placard from the university to allow for close in parking on campus. In addition, she is a non-traditional age student and a current smoker who has attempted to stop smoking but continues to smoke 5 to 10 cigarettes per day. Jamie shares her experiences with asthma care at the SHC, "It's wonderful. It has actually been a Godsend because I don't know what I would do. Because I need prescriptions, and I can't afford to go to the regular doctors. They're too expensive." She does not have a primary care provider in the local community, but she is established with one of the HCPs at the SHC as her primary care provider.

Kat. She is a 26-year-old undergraduate student who was diagnosed with asthma at 1 year of age. At the university she is classified as a senior and her academic major is Psychology. She has lived with asthma for 25 years and her most troublesome seasons are fall and spring. Her self-reported ACT score was 17. Kat is a very analytical person, and she has classified her asthma into four different "types of asthma" depending on her symptoms at the time of an asthma flare-up. In my perception, Kat seemed to be the student most in touch with her asthma, as evidenced by her detailed accounts of self-regulation of her asthma.

Her asthma triggers include mold, chemical smells (perfume and cologne),

cigarette smoke and barbecue smoke and high levels of humidity. She reports being prescribed three medications daily to treat her asthma symptoms including ProAir (Albuterol) inhaler, Singulair, and a daily preventative inhaler (corticosteroid); however, she could not recall the name of the corticosteroid medication. She visits the SHC on campus regularly to see the doctor for an asthma checkup and to get a new prescription for a rescue Albuterol inhaler (ProAir). She considers the local community to be home since she moved to the area from Colorado two years ago. She does not have a primary care provider in the local community and states the HCPs at the SHC are her primary care providers.

“You Don’t Know What you Don’t Know!”: Student Learning Experiences About Asthma on the College Campus

This section will address the first research question, “How do undergraduate and graduate students learn from their experiences to self-manage their asthma during their college years?” The findings of this study show students with asthma really do want to know more about their asthma. The students were clear during the individual interviews that they were interested in learning more about their asthma; however, each student had a different approach to learning about her asthma as revealed by the data analysis. I wanted to get an overall sense of how each student preferred to learn about her asthma and from whom. In addition, I found the students wanted to learn something about their asthma when they encountered the HCP during a sick visit at the SHC. In this study, students want an educative encounter with the HCP, meaning, they are interested in gaining knowledge about asthma and how to better manage their asthma from a doctor. Amy explains, “I want to know the science of exactly like what asthma is. I want a doctor

to like actually sit me down to explain it.” As Amy indicates, her desire is for a doctor to educate her about asthma during the encounter at the SHC. In addition, Amy seems to want more in-depth information about her asthma when encountering the HCP at the SHC. Another topic from the data analysis includes student interest in learning about the proper use of the devices (holding chamber and MDI) used to deliver asthma medications to the lungs. Andrea comments,

I wish I knew I guess about using the chamber with my inhaler. When I first started using my inhaler, I was using it wrong or that’s what I was told by my doctor. So, I guess the proper use of an inhaler.

One student’s experience of learning about asthma from an HCP was less than stellar.

Kat recounts her experience during a sick visit for asthma at the SHC, “I have not learned anything new from my last doctor visit to the SHC; she [healthcare provider] said something about [my asthma] not being managed well according to their chart” (the national asthma guidelines for the treatment and management of asthma). In my analysis, Kat’s comment is an important indicator of the eagerness she has for an educative experience at the SHC on campus. Due to Kat’s analytical nature, it is my interpretation that Kat wants a more in-depth, substantive approach regarding education about her asthma management from the HCPs at the SHC. Kat is a student that is very attentive to her asthma symptoms and how she goes about self-managing her asthma.

Each student desires to learn more about her asthma but in distinctly different ways. Interestingly, while Andrea, Barbara, and Jamie explicitly denied purposely dedicating time to researching and learning about asthma on their own, further analysis indicated that these students do desire to learn about their asthma. Andrea, Barbara, and

Jamie acknowledged they read asthma literature provided by the doctor during a sick visit at the SHC on campus and learned from a visit to their hometown asthma specialists.

When asked about learning resources for asthma, Jamie stated, “It’s been whatever the doctor has given me when I went in for the appointment [at the SHC].” Andrea commented, “I read any information any of the doctors give me. I don’t really do much [additional] research on my asthma.” And, Barbara explained, “I like listen and ask questions to the doctors, but I don’t sit on the side and look stuff up.” Jamie, Andrea, and Barbara believe that a doctor is perceived as the asthma expert, so they each concede to the doctor when it comes to learning information about asthma.

In contrast, Amy and Kat explained how they proceeded to learn about asthma in a self-directed approach. Amy states, “I go online and read on my own; I use Mayo Clinic a lot.” In reference to learning about asthma, Kat commented, “I make notes of things as I go along from experience.” Furthermore, Kat initiates a self-directed learning approach whereby she purposely searches online to access peer-reviewed journal articles on asthma to increase her knowledge of the disease. Kat explains,

I’ve looked up peer-reviewed journal articles on Google Scholar to understand what it is; I learned a lot about asthma reading the articles. I learned what asthma was; I never really knew what it was dealing with it my whole life.

These students desired to learn more about their asthma, and they have personal preferences for learning about asthma. Their approaches are self-directed and involve asking questions, reading medical literature provided at the SHC or in the HCP office, and even perusing medical journal articles about asthma to learn about the disease. Amy and Kat trust the health information they receive from the doctor, and the interactions

with their doctors are integral to their learning about asthma.

Student participants also provided me during their interviews with what they have learned about managing their asthma while attending college. During the interviews, all five students recognized the benefits of having knowledge of how to prevent and self-manage an asthma flare-up. For the student, an asthma flare-up means being sick with the possibility of being absent from class, missing work, and limited daily physical activities due to shortness of breath resulting from their asthma symptoms. Students learned adherence to a physician prescribed daily asthma medication regimen results in better asthma control and subsequently better breathing. For example, Kat explains, “I have better medications to manage my asthma, it is making a huge difference.” Amy prepares for a trip to campus by anticipating a potential asthma flare-up; she comments, “I use my inhaler 30 minutes before I come to campus to try to open up my lungs.” Andrea anticipates what triggers her asthma stating, “I just got to be aware of what triggers it and avoiding it.” Relating better medications to better asthma control was how Jamie and Kat describe what they have learned about managing their asthma while attending college. Jamie states, “preventative maintenance”, which for her means knowing what triggers her asthma (so she may avoid those substances) because she is hypersensitive to chemical smells, such as perfumes and colognes. These students are learning how to effectively manage their asthma on the college campus by being self-aware of their asthma triggers and knowing how to prevent an asthma flare-up.

Resources for Learning About Asthma

Student resources for learning about asthma revealed by my analysis of the data consisted of a trusted relationship with an HCP, written asthma literature distributed at

the SHC, and new health information as a resource for learning. These three resources for learning will be discussed as they relate to student visits to the SHC on campus for asthma care. Firstly, I will discuss the HCP as a learning resource, followed by written asthma literature, and new health information as resources for learning.

The Healthcare Provider as a Learning Resource

As I progressed through the data analysis, I found that student learning about asthma is built on the foundation of a trusting relationship with their HCP. My analysis of the data reveal students acknowledge they prefer a face-to-face meeting with an HCP, which allows them the opportunity to ask questions about their asthma during a visit at the SHC, or at their hometown asthma specialist. The HCP is perceived by the students with asthma as a trusted content expert with the most accurate information about asthma. Furthermore, students want more than to be given a diagnosis and a prescribed treatment plan. They are interested in learning something about their asthma with each encounter with the HCP. Furthermore, students desire a doctor-patient relationship that is open to the possibility of a trusting partnership with the doctor, instead of a purely transactional encounter, to facilitate learning about asthma. Student data also clarified that building a trusting relationship between the HCP and a patient with asthma takes some time. For example, Andrea commented, “My hometown allergist, they know more about my particular case they know me a little more.” Amy explains, “I feel like my doctor back home has all the resources to treat my asthma. I feel he does a pretty good job at trying to figure things out in helping me get the resources to manage my asthma.” In addition, my analysis has made it known if the student perceives the HCP is “on the asthma journey with her”, (Amy and Andrea), then she is more likely than not to view the relationship as

a trusting partnership.

The students who have an established relationship with an asthma specialist, (Amy, Andrea, and Barbara), commented on why they trust these physicians over the HCPs at the SHC in learning about their asthma. Barbara explains, “In my hometown I would always go to an asthma specialist. And I would prefer that over anything else.” And, Amy makes it clear, “If I had it my way, I would go back to a pulmonologist somewhere out here just like to get more information and stay on top of it.” In addition, Amy comments on how her dad helps to educate her about asthma,

My dad works in a hospital, so I talk to him about it [asthma]. I'll tell him and he'll go talk to his friends [coworkers in the hospital] and they'll be like tell her to try this and all this kinda stuff.

Andrea explains how her parents remind her about the importance of appropriate asthma management,

My parents were like you need to stay on top of your things [asthma medications]. You need to do what you need to do. Yeah, my parents kinda pushed me to make sure I stay on top of all that [asthma management routine].

The students who prefer an asthma specialist have some common themes among them. They believe the asthma specialist has the most accurate information and is more knowledgeable about treating asthma when compared to a primary care provider. Additionally, the asthma specialist for these students has an established relationship and is familiar with their asthma history as the specialist and the student have been on the asthma journey together for some time. As well, the order of student preferences for the individuals most trusted to deliver accurate information and teach them about asthma are:

(1) hometown asthma specialist (allergist or pulmonologist), (2) the physicians at the SHC, and (3) their parents. In addition, my analysis shows student participants believe the asthma specialist was most trusted for exhibiting superior knowledge and competence in the following areas when compared to a primary care physician: (1) the care and treatment of asthma, (2) treatment of comorbid medical conditions (sinusitis) that could affect the student's asthma treatment, and (3) knowledge of the student's individual asthma journey over time. Furthermore, the asthma specialist was trusted to provide accurate information about the treatment of asthma over the physicians at the SHC on campus or the parents of the students. Barbara explains,

I trust the student health center more than my parents 'cause my parents didn't get a degree in this kind of stuff. Like if I was going to an actual specialist then I would trust them over the student health center.

For the reasons listed, the asthma specialist is the choice of the three students (Amy, Andrea, and Barbara) for learning about asthma due to a previously established relationship with their HCP. The other two students (Jamie and Kat) did not have an established relationship with an asthma specialist at the time of this study; their asthma was being managed to their satisfaction by an HCP at the SHC.

Asthma Literature as a Learning Resource

My data analysis of the documents acquired through observation during my time spent at the SHC for data collection reveal the most common asthma literature found at the SHC include the following: patient education handouts on asthma from the electronic medical record (EMR), a written brochure on asthma, and a printed asthma action plan developed by the HCPs. These types of literature were used by the HCPs to augment

student learning during a sick visit for asthma care at the SHC. Students commented on which asthma literature they had received from the SHC on campus. Three of the five students (Andrea, Amy, and Jamie) interviewed stated they had received a brochure or pamphlet on asthma from the SHC. The two other students (Barbara and Kat) commented that they had not received any literature on asthma from the SHC on campus. Barbara commented she has learned about asthma in her immunology course as a microbiology major. In addition, she explains,

No, I have not gotten any literature [on asthma] except for what they talked about, but I never got handed a pamphlet. The student health center is more focused on like sex ed than other information out there. I understand it's a college but that's like the only pamphlets I've ever gotten for sexual diseases or different types of birth control. I've never really had any type of thing handed to me about risks or benefits of asthma medicine.

My analysis of Barbara's experience is she desires to learn about asthma and is open to learning whether it be in a college science course, from an HCP at the SHC or from asthma literature. Unfortunately, Barbara leaves the SHC empty handed of any asthma literature, and she remains uninformed about the risks and benefits of her asthma medicine. Andrea and Amy received literature on asthma from the SHC on campus and commented the asthma information was generic. They did not learn any new information about asthma from these resources. Andrea revealed,

They offered me a couple of brochures at the student health center. That's about it; it was kind of just general information about asthma. Normally I just skim through it 'cause it's nothing like treatment wise or anything like that.

As I reflect on the analysis of Andrea's comment above, I sense she is eager to learn more about her asthma, especially as it pertains to the treatment with asthma medications which would include information the benefits and risks of each medication. Furthermore, my analysis of the literature and the student data indicates the asthma literature at the SHC may need to be revised to include information on asthma medications, such as benefits and risks and how the medications work to relief asthma symptoms and any potential adverse effects. Likewise, Amy's experience did not offer her anything new from the literature on asthma she received from the SHC. She comments,

The student health center gave me a pamphlet on asthma triggers, use of inhaler, keeping inhaler handy. The pamphlet talked about generic things any doctor will tell you. I did not learn anything new; I feel like I have been getting the same pamphlet since I was nine.

Likewise, Amy desires a more in-depth explanation of asthma (a concise explanation of the pathophysiology of asthma) to be included in a pamphlet. Jamie was one of the other students who commented she received asthma literature from the SHC. She stated, "They've given me all different kinds of stuff. Pamphlets and printouts that they've made. They've been really good at helping me try to understand it." Jamie's perspective on asthma literature offered at the SHC is different from that the other participants' experiences. Although Jamie did not comment on the content of the asthma literature she received, she was satisfied with literature she was given during her visits to the SHC for asthma care.

The data analysis reveal students are desirous of asthma literature that contains more in-depth information on asthma as opposed to generic asthma literature materials

that may not specifically address college students or the environmental allergens and high temperature and humidity climate challenges of the southwest region of the United States where the research was conducted. In addition, there is inconsistency in the approach to the type of asthma literature distributed to students by the HCPs at the SHC. One may receive a patient education handout on asthma from the EMR and another student may receive a generically written brochure on asthma. The perspective of the asthma literature received by students at the SHC differed from one student to another. The student data on asthma literature reveal the need for consistency between the HCPs at the SHC in the delivery of asthma literature to students with asthma on campus. The students in this study are desirous to learn more about their asthma; they crave an in-depth, academic approach to learning as they would experience in a college science course. These asthmatic students expect to learn something new, and useful, from the asthma literature they receive from the SHC.

New Health Information as a Learning Resource

In addition to the encounters between HCPs and students regarding learning about their asthma during a face-to-face visit at the SHC, other resources surfaced from the data analysis that are important for students in learning new information about their asthma. My analysis reveals several common methods used by the HCPs to inform the students of new health information regarding their asthma. The new information most commonly reported about a student's asthma are the results of diagnostic tests performed during a sick visit to the SHC. Examples of diagnostic tests performed at the SHC on a student with asthma include peak flow measurements, spirometry testing (Appendix L), pre and post bronchodilator study (Appendix L), and laboratory blood work, such as a complete

blood count (Appendix L). All these diagnostic tests would not be performed on every student with asthma on every visit to the SHC. This is the case because an HCP will only order a diagnostic test if it aids him/her in the diagnosis or monitoring of a student's asthma. Once the diagnostic tests are performed the student needs to be informed by a provider of the interpretation of the results and the recommended treatment plan based on those results. The diagnostic test results and the treatment plan may be communicated from the HCP to the student in several ways including a face-to-face encounter at the SHC, written email, telephone conversation, and the internet web-based Healow patient portal (<https://healow.com>, 2019). Importantly, the students in this study are very excited with the on-demand capabilities of the web-based Healow patient portal. Jamie comments, "It's a new system they got not too long ago." The students did not comment if they were given a choice by the HCPs at the SHC as to how they preferred to be informed of their new health information and/or diagnostic test results. However, sometimes the nature of the test determines how the student was informed of the results. For example, if the test results were for blood work from the laboratory it most likely would appear for student viewing on the online Healow patient portal. Barbara explains her experience with the patient portal,

They [HCPs] said if I have any questions, I can use the portal, the patient portal.

You see all your records, your lab work, who your physician was, or nurse and you can send a message to them if you have questions.

The online patient portal is available through Healow, a third-party vendor, which is an internet web-based portal subscribed to by the SHC. The Healow online platform allows the HCPs to upload some of the students' health record for them to view on demand

through a mobile application on their smart phone. In addition, it allows the HCPs and students to exchange messages securely regarding their health record. It is designed to upload components of a student's health record that may or may not be related to asthma care or treatment; it is not exclusively used to communicate a student's asthma information. However, email messages were used by the HCPs in this study to relay new health information to a student such as a new asthma treatment plan that was discussed during a sick visit to the SHC or to communicate a message regarding scheduling a follow up visit for the student. For example, the Healow patient portal allows the student to view a message from the HCP who treated the student or view documentation of a referral to a physician specialist, such as an allergist or pulmonologist. Barbara explained, "On the portal they [HCPs] tell you if you're negative, positive which is awesome 'cause you don't have to sit there waiting." And Jamie shared, "All the referrals if they send you to another doctor, those are on there as well." However, I learned from the focus group interview with the students that the spirometry test results were usually not displayed via the Healow online patient portal due to the apparent limitations of the technology between the spirometry unit and the Healow patient portal. As well, during the focus group interview the students realized the type or amount of student health information viewable on the patient portal varied by the HCP at the SHC. For example, one student's peak flow readings (lung function test) were viewable on the patient portal, whereas Barbara commented that she has never had access to her peak flow readings on the patient portal; she explains, "I've had like the doctor write out my treatment plan to me in an email, but I don't think I've seen like my peak flow levels or ... my blood pressure or any of that on the portal." Importantly, the discussion of the patient portal ended with the

students agreeing that the portal with on demand access to their health record is a definite benefit.

Another challenge in sharing new health information occurs when two physicians at two different institutions attempt to share a patient's health record. Amy conveyed her experience with two physicians employed at two different facilities (SHC on campus and hometown allergist) attempting to share her health record. Amy is the daughter of a military veteran, and she has experienced satisfaction in her asthma care with the military physicians she has been treated by over the years. Amy's statement of her experience with military physicians for the treatment of her asthma sheds light on the issue, "The military doctors no matter where I go, they all have my records on file in a database. They can just like go online and look and see everything." Amy appreciates the continuity she experiences with her hometown allergist, "My doctor at home will communicate with other physicians (other allergists) at another clinic in his group to schedule testing or follow up visits." One of her main concerns about asthma care at the SHC was the sharing of her health record between the physicians. Amy's experience with physician to physician communication at the SHC on campus is not as satisfying as with the military physicians. Amy explains, "It's easier to communicate with the military doctors than it is like doctors who weren't military 'cause I have to give them my records, and one, he was like okay what is this, this, and this?" The lack of continuity between physicians at different facilities in sharing health information contributes to the student's perceived quality of care of the HCP who sees the student for the first time at the SHC. Amy's experience was different from the other students regarding her perception of continuity of care between two physicians. Her past experience with

military physicians may have influenced her perception of the HCPs at the SHC.

To summarize the theme of learning about asthma, students with asthma desire to learn more about managing their asthma during their college years. However, I discovered the students preferred to learn in different ways about asthma. Some students are self-directed learners, and some depend on the HCP to teach them about their asthma. In addition, the students want more in-depth information about asthma during a visit with the HCP. Furthermore, there was inconsistency in the asthma literature passed on to students from the HCPs at the SHC. And, if a student received asthma literature from the SHC, students described it as generic and unhelpful in providing new information about asthma or asthma medications. In addition to student learning about asthma this section addressed the resources for students in learning new health information about their asthma. Based on analysis of the data, the students' preferred method of learning about new health information from their HCPs is the online Healow patient portal. The online patient portal is a favorite of students due to its portability and the on-demand access feature which allows them to view their health record at any time. Furthermore, one student experienced a lack of continuity between physicians at different facilities in sharing health information and this was found to contribute to the student's perceived quality of care of the HCP who sees the student for the first time at the SHC. As well, there was inconsistency across HCPs regarding the asthma literature provided to the students. Some of the students commented that the asthma literature received did not add new knowledge about asthma. In addition, there was inconsistency in the new information students had access to, such as diagnostic tests, via the online Healow patient portal. To conclude this section, Kat had the perfect comment regarding her knowledge

about asthma; she states, “You don’t know what you don’t know.” Students may not know enough about their asthma to ask the right questions in seeking the help from the HCP. The next section responds to the second research question which focuses on the coping strategies of college students with asthma.

Coping Strategies of Students With Asthma

This section addresses the second research question, “How do college students cope with their asthma on campus?” My analysis of the data of how students learn to cope with their asthma on campus is by experience and living daily with asthma. In addition, I found that the coping mechanisms developed by the students are essential to their daily walk with asthma, essential to breathing well, and essential to being successful in college.

Through my analysis of the data I discovered the students’ primary coping strategies on the campus were learned behaviors gained by the experience of living with asthma while attending college. It is my perception these learned behaviors are related to the fact the students were living on their own, and they do not have their parents to constantly manage their behaviors for them. In addition, they attend a large public university surrounded by many people and getting to class involves long walking commutes over a hilly campus. Furthermore, the unfriendly environmental climate of high heat and humidity levels combined with the numerous airborne allergens of the southwest region of the United States are not conducive for easy breathing. The learned behaviors of the students evidenced in the data analysis include the following:

- avoiding crowds of people to limit exposure to asthma triggers, i.e., strong chemical smells such as perfumes and colognes (Jamie and Kat);

- adhering to a physician-prescribed asthma medication regimen (Kat and Andrea);
- monitoring environmental conditions for potential asthma triggers (i.e., air temperature, humidity levels, and pollen count for local airborne allergens) (Barbara and Amy);
- limiting walking distances on campus to avoid overexposure to weather conditions (i.e., high heat and humidity levels) (Jamie and Amy); and,
- pretreating the lungs with a quick-relief inhaler prior to traveling to campus to ready the lungs against asthma triggers (Amy).

Furthermore, lived experience has taught some of the students coping strategies related to daily physical exercise. The topography of the campus landscape where the research was conducted consists of a changing elevation due to the many hills to climb around campus. Barbara explains how she handles the long walking commutes to class, “It’s a lot of walking, so I just make sure I have my inhaler on me basically.” In addition to the many hills on campus there are many stairs to climb to access the academic buildings and the library. Student coping strategy for the stairs on campus is demonstrated by Amy, she states, “Yeah like I’m ready to tackle the stairs, like I got my inhaler, let’s do this.” Jamie’s coping strategy for long walking commutes consist of arranging for close-in parking by obtaining a “handicapped parking permit” from the university, she explains, “It made it 100% better because I was really thinking that I would have to quit [college].” Kat commented on the terrain of the campus, “The physical layout of the campus . . . we know there’s lots of challenges going up and down to get around to classes.” These findings are real life examples of how these students are

developing learned behaviors to cope daily with their asthma on campus. It is clear these asthmatic students must act defensively against the environmental elements they face each day in preparing to get to campus, walk to class, and carry out their daily activities.

Another strategy for coping was related to how the students adjusted to the extreme weather conditions of the southwest region of the United States. Most of the students commented the high heat and humidity levels were factors in coping with asthma. Jamie comments, “The hills and the weather and again, those are the things that I have no control over.” Amy explains her coping with the extreme air temperatures, she states, “I try not to wear a lot of clothes, so my body doesn’t get too hot, cause if I get too hot then it’ll mess with my chest.” In addition, airborne allergens (tree pollen and grass pollen) played a role in coping with asthma. To aid in coping with airborne allergens, Amy and Barbara downloaded a weather application on their smart phones to monitor and check the daily air temperature, humidity level, and pollen count for the local area since these conditions may trigger their asthma. Barbara explains how she monitors the daily pollen count, “When the pollen is high and then I look . . . I have the Weather Channel app and they tell you the pollen in your area.” As a unique coping strategy, Kat developed an elaborate system of coping with her asthma daily; she describes three “types of asthma” as follows,

I feel there's different types of asthma I get, and so I'd say the most dramatic classic one I call it the *wet asthma*. And it will start really, really fast, like seconds; this type is the easiest to treat, like it goes away really quickly once I can finally get a breath in to use my inhaler. It just feels wet. Then there's the *dry tight one*, which I think is like that's the one that is less dramatic, creeps up but is the

worst and the hardest to treat. This is the one where like I'll use my inhaler all day long, like every 20 minutes, and it's like I can't shake it. The other kind of asthma is like I'll feel *really intense or sharp or dull pain* in certain spots, and I used to not know that was asthma, so we'd be working out and I'm thinking it's my muscle and it's in excruciating pain.

Kat has a very analytical approach to coping daily with her asthma. Her elaborate system of coping with asthma exhibits a level of self-regulated behavior that has allowed her to cope with her asthma by creating “categories” of asthma and how she treats each “type” of asthma. Indoor air quality may also trigger a student’s asthma and require specific coping strategies. Jamie relays her experience avoiding crowds of people due to her sensitivity to chemical smells; she comments, “I try to schedule my classes early as possible to avoid the heavy crowds of people with perfumes or colognes which trigger my asthma.” My perception is that these asthmatic students must be more “in-tune” with their breathing than their healthy peers. It is my sense these students must have a keen knowledge of their asthma triggers to increase their chances of surviving through the day without experiencing breathing difficulty.

Asthma medications also represent an important coping mechanism for some students in aiding them with managing daily asthma symptoms. Andrea explains her compliance with asthma medications as a coping mechanism; she states, “Coping, I mean I stick to my normal medications the doctors have me on.” Similarly, Kat comments, “My rescue inhaler is my coping mechanism.” Regarding students establishing a daily asthma medication regimen, Andrea describes her daily routine, “I always have to think do I have my inhaler with me . . . do I have backup like Benadryl just in case I feel a flare

coming on?” Barbara shares her daily medication regimen preparation, “Making sure I have my inhaler all the time and making sure I’m either on my regular medicine. Making sure I’m taking it because I tend to forget sometimes.” My analysis of participant comments on their medication regimens reveal the underlying anxiety that accompanies students with asthma; the worry of surviving throughout the day without an asthma flare-up.

Medications: Acquisition and Use

Another challenge for the students that surfaced in this study was the acquisition of asthma medications, which was related to the exorbitant cost. In addition, the proper use of the medication delivery devices and the understanding of how asthma medications work in the lungs to relieve symptoms presented the students with challenges as well. During the interview process, in which I reviewed each student’s list of physician prescribed asthma inhalers, it was evident to me the students lacked basic general knowledge of asthma medications. Furthermore, the students did not have adequate knowledge of their asthma medications including how the medications work to relieve symptoms, the most common side effects, or the benefits of the asthma medications they were prescribed. Kat shares her experience with asthma medication, “The biggest challenge is, the rescue inhaler doesn’t always just completely make my asthma symptoms go away.” Jamie explains her issues with asthma medications, “I’ve tried taking the maintenance medications [corticosteroids], and I have them at home, but I haven’t taken them because ProAir [quick relief inhaler] seems to work the best without giving me all the side effects of the maintenance ones.” Barbara comments on using her asthma medication,

Yeah, the long-term steroids are the ones that have helped me and after I feel my symptoms relieving after like a month I kinda start slacking on taking them and that's what allows my asthma to flare-up again especially like during cedar pollen season.

Kat's, Jamie's, and Barbara's perspectives on asthma medications reveal they are struggling to learn how to best manage their asthma from their daily experiences of living with asthma and their limited knowledge of asthma medications. Furthermore, students without medical insurance coverage have enhanced challenges. Jamie relays her concern about the cost of asthma medications,

Whatever medication is not within my budget, the doctor and I just don't even have conversations about it anymore. Since I'm paying out of pocket for the medications it does limit things. For me just being able to afford it.

Jamie continues, "I have gone on free asthma programs for the poor through the [pharmaceutical] manufacturer, and that helps tremendously, both with stress and with daily maintenance [of my asthma]." Amy shares her perspective regarding the cost of asthma medication, "Like sometimes the medicine is just like crazy expensive and insurance doesn't do anything." Similarly, Barbara shares her story,

The doctor just gave me a sample of Advair medicine because since I was paying for so much other stuff, she's like let me see if I have something for you. I was pretty happy because asthma medicine is insanely expensive.

The need is great at the SHC for even the most basic asthma education, such as knowledge about the proper use of an asthma inhaler, knowledge of the benefits and adverse effects of asthma medications, and how to recognize an impending asthma flare-

up. In addition, the exorbitant cost of asthma medication may require the student to choose between paying for medication or some other pertinent items such as rent, food, or gas for their vehicle. Furthermore, the exorbitant cost of asthma medications may hinder the student from being compliant with a physician prescribed treatment plan.

Owning the Disease

An additional impacting factor of student coping strategies was the transitioning of some of the participants to an adult role as evidenced by independent health care decision-making by some of the students. The students recognize they need to take full responsibility for their asthma care, for example, knowing how to access an affordable asthma inhaler, adhering to a physician prescribed medication regimen, or utilizing self-monitoring techniques to assess their asthma symptoms to prevent an asthma flare-up.

Transitioning of students to an adult role in this study refers to taking more responsibility for one's own health care decisions and having increased independence from parents. Barbara and Andrea are 23 years and 22 years respectively are in the transition of separating more and more from their parents regarding health care decisions. Andrea comments about her transition to an adult role, "I had to be the one to take full responsibility [of her asthma]." And Barbara explains her newly accepted role, "I'm living alone, so I don't have my mom on my back about taking care of my asthma as much, so I've had to take it under control." Andrea's and Barbara's comments exemplify their fledging adult role in taking on more responsibility for their health care decisions and increasing their independence from their parents.

Even though Amy is 24 years of age, she is grappling with her adult role regarding asthma management; she explains, "My mom texts me every day about the

weather, like the humidity and the pollen. And, she worries I may not be able to handle the hills and stairs on campus.” Amy reveals the reality of living with asthma while decreasing her dependence on her mother at 24 years of age. Transitioning to an adult role is ongoing for some of the students in this study, and it may be more so with the task of learning to manage their asthma and make health care decisions during their college years. For example, Barbara explains,

Being a college student, I don’t want to spend my money on like an inhaler or a doctor’s appointment. But I ignored my asthma a lot when I got to college, and it got bad enough to where I had to start doing something about it. I had to take my asthma under control.

Andrea explains her reasoning for taking responsibility for her daily asthma treatment plan, “I guess I’m pretty religious about taking my medicine just ‘cause I like feeling good all the time.” Barbara comments again about her move toward an adult role as she explains, “The biggest challenge was from like being forced to take asthma medicine to actually wanting to.” The comments by Barbara and Andrea are examples of young adults taking new ownership of their health. These students are showing increased independence from their parents as they strive to take full responsibility for their daily asthma management. The important take away from my analysis of the coping strategies of students are that those students who are transitioning to an adult role have recognized the significance of taking full responsibility for managing their health care. And, better breathing for these asthmatic students is dependent on them “owning their disease”.

To conclude this section on coping strategies, the students are learning from their lived experiences how to manage their daily walk with asthma on campus. My overall

sense is the students are coping with their asthma in the best way they know how, which is through learned behaviors gained by the experiences of living with asthma on a campus that is hilly, hot and humid, and loaded with airborne allergens. In my perception, the importance of these findings regarding coping strategies are that students cannot afford to take their breathing for granted (like those without asthma will tend to do); they must be on the defensive each day to guard against the potential asthma triggers that are looming in the air, up and down the hills getting to class, and with each hot and humid day.

Student Perceptions of Asthma Care at the Student Health Center

Per the mission statement on the university's website, the SHC is a resource for students on campus offering affordable prices, and health insurance coverage is not required to be seen by an HCP. In addition, the SHC's vision is to help students succeed by promoting healthy lifestyles and creating a healthy campus environment. All student participants had the experience of visiting the SHC on campus at least once for asthma care and treatment prior to participating in this study. These student experiences at the SHC were documented during data collection to obtain the perceptions of the students regarding their interactions with the HCPs during their visits for asthma care.

The data analysis revealed student experiences at the SHC were positive overall regarding the HCPs' demeanor when treating students with asthma. Four of the five students, (Andrea, Barbara, Jamie, and Kat) share positive experiences related to their visits to the SHC for asthma care. The first example is from Andrea who states, "I think they're [HCPs] really helpful and they're really nice there. They kinda guide me and told me take allergy medicine and usually it'll kinda subside." Barbara adds, "She [HCP] gave me a breathing treatment, some steroids, told me to follow up, so that's why I went

another time [for a follow-up visit].” Jamie explains her experience at the SHC, “It’s wonderful. It has actually been a God-send.” And lastly, Kat shares her SHC experience, “Pretty good, I like Dr. Jones (pseudonym); she’s one of the better doctors that I’ve had.” These students identified the importance of having a conveniently located and affordable primary health care facility on campus whose primary mission is to help students succeed by promoting healthy lifestyles and creating a healthy campus environment is essential for the well-being of students with asthma. In addition, the students’ positive experiences are related to how they perceive the competency of the HCP in the care and treatment of their asthma at the SHC. The data suggests that a competent HCP aids in building student confidence and trust in the HCP’s ability to deliver optimal asthma care.

Another aspect of the students’ perceptions of the asthma care received at the SHC are the resources and diagnostic tools available to assess and treat students with asthma. For example, Andrea, Barbara, and Jamie explained the SHC utilized some of the same asthma tools and treatments they were exposed to at their asthma specialist’s office such as spirometry, peak flow monitoring, and breathing treatments. These are asthma care tools and procedures the students have found in common between their asthma specialist and the HCPs at the SHC on campus. However, one student, Amy, experienced at least one less than satisfying visit to the SHC for asthma care. Amy explains her encounter with an HCP during an asthma care visit, she states,

I feel like they (NP) were limited in their knowledge about asthma. She is not an asthma specialist, and I just don’t feel like she 100% knows what is going on. I get a more thorough exam when I go home to see my allergist.

Furthermore, Amy commented she felt this HCP should have been able to answer her

questions about the treatment of her asthma, she explains,

I guess I wish they could tell me at the health center as far as like okay I get it, she said she heard resistance in my lungs as far as like breathing. I guess I was like okay what does that mean? You know, like can you explain a little bit more? And she was like, “I have to get the doctor and he's busy.” What do you mean you have to go to the doctor? Why can't you tell me?

Amy clarified the HCP stated she was not sure how to answer Amy's question about her assessment of her lungs and breathing and that she would need to consult with a physician. However, a physician was not available at the time of Amy's visit to the SHC. Amy's experience exemplifies her expectations that HCPs at the SHC be skillful in assessing for signs of asthma and explaining to the student his or her findings of the assessment of the lungs. As defined in chapter I, NPs work autonomously and in collaboration with a licensed physician to provide a full range of primary, acute, and specialty health care services. The NP is qualified to work with students with asthma as is a primary care physician. However, the physician (referred to in the NP's comments) may have had more experience working with students with asthma. In general, when comparing a NP's time in clinical training to a physician's time in clinical training (residency), the physician's is longer in duration thereby allowing for more hands-on experience. Furthermore, the physician referred to by the NP at the SHC may have had more years of experience working in college health. My interpretation of these students' perceptions of their experiences at the SHC is that HCP competence is crucial in gaining a student's trust in asthma care received from the HCPs at the SHC.

In addition, the assistance students received from the HCPs regarding acquisition

of discounted asthma medication with coupons was viewed as the HCPs having knowledge and competence with asthma care. However, some of the students expressed during the focus group interview concern the SHC was not able to provide consistent help in obtaining coupons for discounted asthma medication, meaning, not all visits by a student to the SHC pharmacy for asthma medication resulted in acquisition of a discounted medication. Yet, all the students agreed the SHC pharmacy was less expensive when compared to purchasing an asthma medication at a retail pharmacy in the local community. During the focus group interview it was revealed through discussion with the students the SHC pharmacy would sometimes have free asthma medication samples to give to the student in need or students without medical insurance coverage. Barbara commented, “without insurance the QVAR inhaler was \$80 with a coupon from the SHC pharmacy instead of around \$130.” For Barbara, access to discounted asthma medication will more likely than not allow her to be compliant with the HCP’s asthma treatment plan for her. Barbara’s comment signals the importance of students having access to lower cost asthma medications from the SHC.

To conclude this section, it is my perception that some students are highly concerned about the exorbitant cost of asthma medications which precipitates worry and concern regarding paying for medications to treat their asthma. It is my observation students desire and need access to affordable asthma medications. And, in general the students are confident in the knowledge of and competence of asthma care provided by the HCPs at the SHC. Notwithstanding the cost of medications, it is my perception that the SHC has a real advantage over other healthcare providers in the local community regarding the affordability, convenience, and student focus of healthcare services. The

cost of care and treatment is less than a privately-owned urgent care center, local hospital emergency room, or primary care provider in private practice in the community, especially for the student who does not have medical insurance coverage.

Improving Asthma Care on Campus: Student Perspective

As a follow up to the previous section, the student perception of asthma care at the SHC, I wanted to address the students' perspective on what they think the SHC or university could do or should do to improve asthma care on campus. I value the input students have about how the SHC and/or university can improve the care of students with asthma. During the focus group interview the students outlined what they wished the university or the SHC would do differently or better to help students learn about and live with asthma during their college years. The first student suggestion was to offer low cost asthma medications available to students who do not have medical insurance coverage. Barbara explains, "Maybe just talk about creating a pharmacy assistance program for students without insurance." The data reveal students (and HCPs) believe it is paramount that asthmatic students have access to low cost asthma medications, especially corticosteroids. Another suggestion addressed access to university services available to students with asthma to improve mobility on campus. For example, Barbara states, "Get a key to the library backdoor, lower level to avoid the stairs." The university library sits atop a large hill on campus and to access the main entrance from the east side requires students to climb many steps to enter the building. During the focus group interview Jamie mentioned she was able to acquire a key from library staff to an outside door at the ground level floor of the library, which allowed her to avoid climbing the stairs to access the building. The library staff allowed Jamie to have a key card due to her asthma

diagnosis; however, it was news to the other students that this option was available upon request. Kat has a practical approach to her reflection saying, “The only thing I’m thinking of to add would be like the Office of Disability Services would allow accommodations for students with asthma.” And, since she experiences asthma symptoms intermittently, she does not know if she is able to convince the staff of the Office of Disability Services her asthma meets the requirements for accommodation just like any other physical disability. The Office of Disability Services, located on the university campus, ensures that students with disabilities have opportunity to reach their full potential by coordinating academic accommodations and support services. Kat views her asthma as an invisible disease, and she may be treated differently by the Office of Disability Services than other students with a disability on campus.

In addition, my analysis shows an additional improvement recommended by the students at the SHC include access to formal instruction by a content expert on the use of asthma medication delivery devices, asthma monitoring tools, and the pathophysiology of asthma. A certified asthma educator could be available face-to-face to educate students at the SHC or online through a telehealth device. Jamie explains, “Along with the peak flow meter it’d be cool if they included a holding chamber for my inhaler.” Amy adds her comments on understanding asthma, “I want to know the science of exactly like what it [asthma] is. I want it [asthma] more broken down so I can fully understand exactly what it is.” Barbara adds, “You know, whenever I was young I didn’t even like try to learn about it, and now as I’m older obviously I try to learn about it.”

Finally, the students were concerned about the lack of consistent documentation by the HCPs of the student health record on the online Healow patient portal, meaning,

some students had a more comprehensive health record than other students posted on their online Healow account. Andrea states, “I guess make sure they share each student’s peak flow record on the patient portal.” The diagnostic tests related to the students’ lung function testing (peak flow and spirometry) were not always uploaded to the online patient portal for access by the student. The data suggests lower cost medications are at the top of the list of suggestions, followed by implementing a formal curriculum for asthma education, improving mobility around campus, and a final suggestion by the students is for the HCPs to be more consistent in communicating the students’ health record on the online Healow patient portal.

The salient themes derived from the student data reveal the story of how students are learning about and coping with asthma on a college campus. Even though they have gained some knowledge about their asthma from lived experience, my analysis shows these asthmatic students desire to know more about their asthma. My analysis shows the students’ most trusted source for learning about asthma is the asthma specialist; this is because of the students’ perception of his or her superior knowledge and competence in asthma care. These students desire written asthma literature to focus on the risks and benefits of asthma medications and how to properly administer inhaled medications. Regarding learning about asthma on the college campus, my analysis shows students are eager to receive more information on asthma from the HCP at the SHC regarding the treatment and management of their asthma through a working relationship with the HCP who utilizes a patient-centered approach in the delivery of asthma care. In addition, the SHC is the first choice of the students in this study when seeking care and treatment for their asthma while enrolled in college and the student experiences with asthma care at the

SHC were for the most part positive. The lack of medical insurance coverage among some students with asthma may negatively affect their overall health and well-being due to limited access to asthma medications. Furthermore, the primary coping strategies of these students with asthma are learned behaviors gained by their experiences of living with asthma on campus. It is my hope that each of these themes from the student data will serve as a benchmark as I work collaboratively with the medical director and the staff of HCPs at the SHC to improve the delivery of asthma care to students with asthma on this large, public university campus located in the southwest region of the United States with its hilly campus, extreme weather conditions, and many airborne allergens.

Conclusion

Students with asthma are learning from their lived experiences with asthma on the college campus. However, they desire to learn more about their asthma including the science of what is happening in their lungs with asthma. Well-written asthma literature directed to the college students' academic mind-set and well-versed HCPs in the art of asthma education can aid the student in learning to better self-manage their asthma. It is my perception that keen knowledge of asthma is key for students in learning to optimally self-manage their asthma. Asthmatic students have acquired coping strategies from learned behaviors of living with asthma on a campus with extreme weather conditions, a hilly terrain, and loads of airborne allergens. Those students who are transitioning to an adult role have grown more independent from their parents regarding control of their asthma management and becoming more autonomous with healthcare decision-making. Furthermore, the exorbitant cost of asthma medications is hindering the HCPs in delivering optimal asthma management for students, and it is preventing the students

from being compliant with an appropriate asthma treatment plan. I really sympathize with the student participants in this study and am grateful for their in-depth discussion and analysis of their experiences.

Part II: “They Don’t Know What They Don’t Know”: Healthcare Providers’ Perceptions of Asthma on the College Campus

The remainder of this chapter documents the second phase of the data analysis which addresses the third research question, “How do healthcare providers on campus perceive the current state of asthma education and management of college students on the campus?” Through data collected via the interviews with the HCPs, I wanted to assess their perception of the current status of asthma education and management within the SHC and on the college campus. In addition, I wanted to assess their perceptions of how asthmatic students are learning about, coping with, and the misconceptions they may have of living with asthma during their college years. First, I will present a brief profile for each healthcare provider interviewed for this study.

Profiles of the Healthcare Providers

As previously stated, there were a total of five HCPs interviewed for this study consisting of two physicians, one male and one female, and three female nurse practitioners all of whom were employed at the SHC on the college campus where the research was conducted. One physician graduated from a medical school that offered the Medical Doctor (MD) degree and the other physician graduated from an osteopathic medical school which granted the Doctor of Osteopathy (DO) degree. The three nurse practitioners are graduates of master’s degree nursing programs and are certified as family nurse practitioners (FNP). The five providers have an average of more than 10

years of experience working in college health.

Bill. A board certified primary care physician who attended medical school at a university located in the northeast region of the United States. After completing a three-year residency in family medicine for the Doctor of Medicine (MD) degree, he completed additional training consisting of a one-year fellowship in primary care sports medicine at a hospital in the southwest region of the United States obtaining a certification in non-operative orthopedics. This certification allows him to treat students and student athletes for all types of sports injuries which he assesses and determines if the student needs to be referred to an orthopedic surgeon for a surgical procedure. In addition to working with college athletes he has also served as team physician for college athletic teams and a professional hockey team. Bill currently serves as the primary liaison for the athletic department at the university with the SHC in addition to his duties as a primary care physician. When I asked him, what are some of the strategies students use to manage their asthma he explained, “What their strategy is, is treat it as it’s a problem, when it’s a problem. For a lot of them, that’s just the albuterol as needed.” Bill has worked in college health for the past fourteen years and he has been employed at the SHC on campus for the past six years.

Debbie. A Registered Nurse (RN); she has worked as a Family Nurse-Practitioner (FNP) for the past twenty-five years. She earned her Bachelor of Science in Nursing and a Master of Science in Nursing with a focus in community health at universities located in the deep south region of the United States. Her nursing background is in rural healthcare, emergency room, operating room, post-surgical patients and she also worked as a family nurse practitioner in a family practice setting. When I asked about her

perception of working in college health she states, “It’s challenging because we’re meeting people that are starting to learn about their health and care for themselves, so that makes it a unique experience.” She has fifteen years’ experience working in college health; all fifteen years she has been employed at the SHC on campus.

Gabrielle. A board certified primary care physician; she earned the Doctor of Osteopathy (DO) medical degree at a university located on the west coast of the United States. She completed a three-year residency in 2003 in family medicine at a hospital located in the southwest region of the United States. Gabrielle has a varied work history as a physician which includes working at a homeless clinic for a large metropolitan city located in the southwest region of the United States, at the Salvation Army for two years, and she worked in hospice care until she found her preferred area of practice, college health. She comments on her varied work experience, “I learned a lot of things that I wouldn’t have learned unless I had taken those specific positions.” When I asked about her perception of working in college health she comments,

I really love working in college health. I first came here through an agency to fill a slot for another physician who was on maternity leave. College health definitely is its own specialty in a way, and I discovered that I really liked treating young people and liked what they taught me.

She has been employed as a primary care physician at the SHC on campus for over seven years.

Lilly. An RN and FNP; she works as a primary care provider with about half of her workday helping with women’s health issues and prevention visits and the remainder of the time in general practice treating students with asthma and injuries. She graduated

with a bachelor's degree and a masters' degree in nursing from a university located in the southwest region of the United States. She then completed a post-masters' program at another university in the southwest region of the United States to earn the FNP credential.

When I asked about her perception of working in college health she commented,

I would call it a transitional population, and the students are going from sort of being under the care of their parents and their families. And when they come to school, sometimes they are very unaccustomed to making their own decisions about their healthcare. So, they like to consult with their families.

Lilly has been employed in college health for the past twelve years; all those years she has worked as an FNP at the SHC on campus.

Pam. An RN and FNP; she works as a primary care provider at the SHC on campus and has previous experience working with patients throughout the human lifespan, birth to death. She has taken care of patients with acute and chronic issues, including obstetrics and pediatric patients. Pam has earned two nursing degrees from a university located in the southwest region of the United States; a bachelor's degree and a master's degree. At the university where she obtained her master's degree in nursing, she was involved with some research projects through the academic medical center; she also has experience working in occupational health. And, when I asked her opinion of the strategies students use to manage their asthma she stated, "They pretty much want quick treatments. They want quick results, one magic pill that works for everything." Pam has worked in college health for five years total with the past two years being employed at the SHC on campus.

Learning about Asthma Treatment and Management: Healthcare Providers

I discovered from analysis of the data that most of the HCP's continuing education of how to care for asthmatic students has been acquired through the day-to-day experience of treating and managing asthmatic students at the SHC on campus. All the HCP participants stated they initially learned about asthma treatment and management during their formal education in their respective medical schools or graduate nursing school programs. However, the analysis of the data shows the education and training regarding the diagnosis, treatment, and management of asthma was minimal during the HCPs formal medical education. The data indicate the HCPs in this study are learning from experience as they provide care to asthmatic students. In addition to learning by experience, two of the HCPs mentioned they engage in self-directed learning to gain knowledge about asthma through researching the national asthma guidelines (GINA, 2018; NAEPP, 2007) and other sources such as the online clinical decision support resource www.uptodate.com and www.mayoclinic.org. Debbie explained, "I learned about asthma briefly in my training, but most I learned in practice and mostly self-directed and seeking out a framework for asthma management." Pam offers, "It started with training in school during the nurse practitioner program and then seeing patients on a regular basis kind of how to teach and learn the [national asthma] guidelines." Bill adds, "I learned a little about asthma during medical school and mostly in residency for family practice." Similarly, Gabrielle comments, "I guess initially in my residency program, but truthfully by practicing medicine." Lilly states, "It was through my program to begin with, through the nurse practitioner program because that was part of the system's education that we got." Debbie relates how learning by experience is occurring

in her practice of medicine as well. She explains, “I think that with practice, you start learning what is going to work, but the practice component is most successful when you are going to have a follow-up visit.” Learning from experience is a valuable component of the HCPs’ education in the treatment and management of asthma of college students.

My analysis shows that providing high-quality services to asthmatic students on campus requires the acquisition of up to date knowledge and skills in asthma education and management by the HCPs. The HCPs shared how they learned about the treatment and management of adult asthmatic patients, which included diagnostic testing such as spirometry (a basic lung function test for asthma). The national asthma guidelines recommend the use of spirometry by HCPs to aid in the diagnosis, treatment, and monitoring of asthma. During the interview process I asked about the availability of spirometry testing at the SHC. Debbie informed me that spirometry is available at the SHC; she comments, “We do have that [spirometry] available at the nurse clinic.” The nurse clinic is staffed by RNs, and they are the individuals who perform the spirometry testing. The HCPs do not perform the spirometry testing. Of the five HCPs interviewed only two indicated having experience in spirometry. Bill explained he conducted spirometry testing on veterans for disability determination at a previous employer. When asked about previous spirometry training he commented, “My spirometry education is from continuing medical education courses and online articles.” He did not relate any other experiences regarding lung function testing except for the use of peak flow testing for students with asthma. Lilly, a nurse practitioner, submitted,

So, lung function testing, on an academic sense, I learned what that was. But

hands-on, what we do as a lung function test is actually a peak flow and then, but

we do have spirometry too. So, I'm not trained in spirometry, so I haven't done it. I've had it done to me, so I kind of know how it's done, but the RNs are trained in how to do the spirometry test.

Lilly explains how additional training in spirometry is needed for the HCPs,

I love what you said about having more training for us. I think my level of confidence with managing asthma appropriately is probably...okay, I'm going to give myself a little bit lower grade, like 70 to 80%. If you ask me to do a spirometry test right now and interpret it, I'd be like, uh. So, I would like to feel more confident that I'm doing everything that I can to help that student, and I want to motivate them.

Debbie was asked about performing spirometry; she explains, "We do not have it [spirometry] in our rooms for each patient visit like I would prefer because I understand it's a better measuring instrument, but we do have that available at the nurse clinic."

Although Debbie did not share any past training courses she has completed in spirometry, she did have the following to offer, "But, with the spirometry, that they need to exhale for 6 seconds? I go for 4, so I'm like, I don't know?" Here, Debbie is questioning me on how to properly obtain, according to published standards, accurate and valid spirometry results for adults. Debbie's and Lilly's comments on spirometry reveal they understand the importance of conducting spirometry on asthmatic students; however, they do not have the practical hands-on training in conducting spirometry and rely on the RNs in the SHC clinic to perform valid spirometry tests.

Gabrielle explains her approach to learning about lung function testing,

So, we learn the rules and we learn what normal pulmonary function is when we're learning about the body. So, what you learn in the book, but there's more to learn and you can learn what you know about normal lung function and abnormal lung function.

And, Pam offers, "We do have spirometry, but I don't tend to use it a lot if they have history of asthma already diagnosed. The nurse clinic performs spirometry here." Lilly adds her comments on the topic of lung function testing; she explains, "I know you're supposed to say, go, go, go, blow, blow, blow." The data presented here on spirometry shows the HCPs are not performing spirometry on students, but they defer to the RNs at the clinic within the SHC to conduct the spirometry test. It is my perception that the HCPs do not perform spirometry on asthmatic students because of time constraints during a sick visit with an asthmatic student and the in-take process at the SHC is designed for the RNs in the clinic to perform spirometry testing. Furthermore, the HCPs' lack of hands-on training in spirometry results in a lack of confidence in performing and interpreting the test results. It seems to me that spirometry is recognized by the HCPs as an essential component of an asthma management program (as outlined in the national asthma guidelines). However, it appears not to play a prominent role in the HCPs' day-to-day management of asthmatic students on campus.

Prior to the healthcare provider interviews, I had a conversation with the medical director of the SHC, and he informed me that two years prior he had implemented the use of peak flow measurements for students who present with complaints of asthma symptoms at the SHC (medical director, personal communication, May 12, 2018). The HCPs follow a protocol which indicates to perform a peak flow measurement on all

students who present at the SHC complaining of asthma symptoms. The peak flow measurement provides a single measure (in liters per minute of exhaled air) of lung function and prompts the HCP to administer a bronchodilator (Appendix L) medication if a student's peak flow number is low compared to a nomogram chart (predicted normal chart of peak flow) for individuals of the same age, height, and gender. The data reveal the HCPs do not feel competent in performing spirometry testing for asthmatic students due to the lack of appropriate education and training. Furthermore, because the RNs in the clinic area perform the spirometry testing on students, the HCPs do not get the hands-on experience in performing the test which warrants additional education and training for the HCPs to become competent in the performance of spirometry testing.

In addition to the HCPs' learning about the optimal performance and interpretation of spirometry, the HCPs were asked about their knowledge and use of the national asthma guidelines, namely, the National Asthma Education and Prevention Program (NAEPP, 2007) and the Global Initiative for Asthma (GINA, 2018). These asthma guidelines describe a "curriculum" for the diagnosis, treatment, and management of asthma. Through my analysis of the data I wanted to assess if the HCPs had adequate knowledge of the national asthma guidelines and how, if utilized, they implemented the guidelines into their practice of asthma education and management of asthmatic college students.

The 2018 GINA report recommends everyone with asthma receive a personal asthma action plan (AAP). Personal AAPs show patients how to make short-term changes to treatment in response to changes to their symptoms and/or peak expiratory flow, as well as, how and when to access medical care (GINA, 2018). The data for this

study shows the HCPs did not always develop an asthma action plan for the asthmatic student as recommended by the GINA report. This lack of knowledge of the national asthma guidelines may provide evidence why some of the HCPs are not providing students with a written AAP. Debbie discloses,

I didn't have an asthma action plan initially; I was just treating and not really having a set plan. I found the National Heart Lung and Blood Institute online has a wonderful asthma action plan. I go by that framework now, but initially I was just treating and not really having a set plan.

As well, some of the HCPs were not confident in declaring their full knowledge of and/or practical use of the NAEPP or GINA guidelines. The following quotes provide some insight into the HCPs' knowledge or lack thereof of the national asthma guidelines.

Bill states,

To be honest, I don't know the formal names of the protocols [asthma guidelines]. I know that step 1, step 2, step 3, step 4, depending on how often you're getting flares, during the night, waking up, the times you have to hit the Albuterol, steroids, that sort of thing.

Debbie comments when asked about the national asthma guidelines saying, "No, I don't know anything about GINA or the NAEPP program." And Gabrielle adds her thoughts suggesting,

A little bit, the second guidelines, the National Asthma Education...what is it? [My response . . . National Asthma Education and Prevention Program.] Yeah. I've been on their site before but no, I didn't know before looking at this...about the GINA guidelines.

And Lilly explains her knowledge of the asthma guidelines saying, “So, I couldn’t discriminate between those two, National Asthma Education and Prevention Program and GINA, and I don’t really know about GINA. Okay, so I haven’t even seen those . . . the GINA guidelines.” Pam was the only HCP that seemed confident in her knowledge recognizing the names of both of the national asthma guidelines. She commented saying,

I know about both those programs [NAEPP and GINA]. We learned it in school and then just following when patients come and you are diagnosed with asthma, you go through it, you know, what steps you need to do, what things you need to start them, what is your mild . . . you know, exacerbations, what criteria they have, what symptoms they have to have, things like that.

Through analysis of these data, I discovered a gap amongst the HCPs regarding the knowledge of and use of the NAEPP and GINA asthma guidelines. In addition to recommending more training for the HCPs in lung function testing the data reveal learning the protocols presented in the asthma guidelines will increase the confidence of the HCPs in the implementation of the guidelines as well as establishing consistency in their approach to the treatment and management of asthmatic college students on campus. The data indicate that the improvement of asthma care at the SHC may be enhanced by consistent implementation of the asthma guidelines by the HCPs for the diagnosis, treatment, and management of asthmatic college students.

In addition, the HCPs recognize that college students with asthma are a difficult population to effectively manage due to several factors which may be out of the control of the HCPs. However, even though the HCPs lack proficiency in spirometry and knowledge and use of the asthma guidelines, through my analysis of the data I have

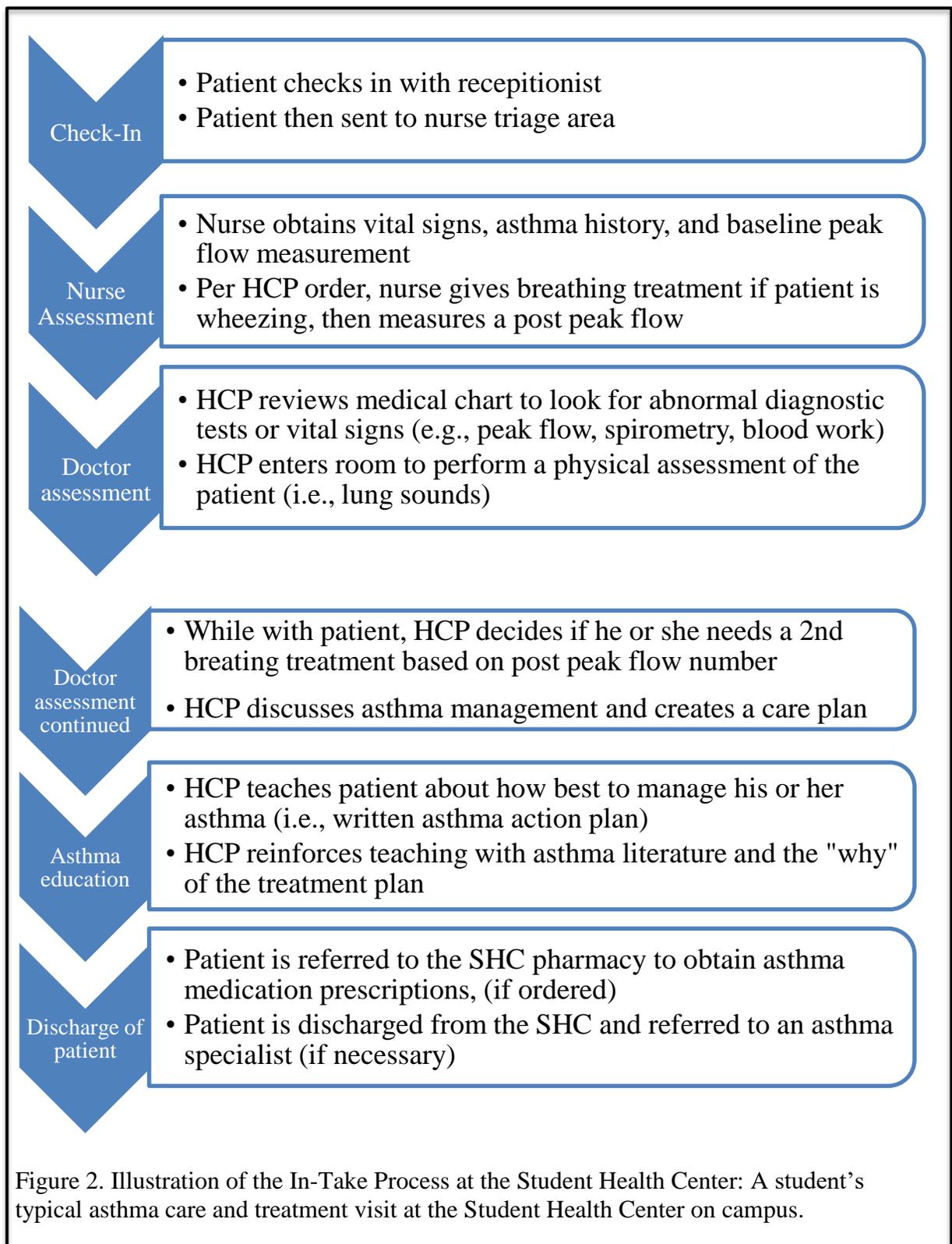
discovered the HCPs have given top priority to improving the care of students with asthma on campus. In the next section I will address how an asthmatic student might proceed for asthma care through the eyes of the in-take process as described by the HCPs.

The In-Take Process at the Student Health Center

The HCPs employed at the SHC are primary care providers that treat many types of acute illnesses and a variety of chronic conditions, including asthma. In a typical sick visit for an asthmatic student complaining of symptoms such as wheezing, shortness of breath, and coughing the HCPs provided me with their perspective of how a student's visit might proceed through the SHC. Each HCP has the responsibility to treat and manage asthmatic students when they seek treatment at the SHC for their acute asthma symptoms. The typical in-take process is outlined in Figure 2. The in-take process includes check-in, assessment, asthma education, treatment, and discharge for a student with asthma symptoms visiting the SHC. After the initial check-in process with the receptionist, the student goes back to an exam room for the encounter with the HCP. Debbie states the typical visit is, "30 minutes. I think that's reasonable", which includes being interviewed and examined by the HCP. Debbie shares her experience of a sick visit for an asthmatic student,

It's a time intensive visit. Because it's an assessment, there's a nebulizer [breathing treatment], there's teaching, there's often prescriptions that have to be reviewed, and you just know it's going to take time, and you're going to get behind on your schedule.

During the actual 30-minute encounter between the HCP and the student, the HCP spends time interviewing the patient to assess the current complaint (shortness of breath,



wheezing, and coughing) of the student so an accurate diagnosis can be made along with a review of current medications so that an appropriate prescription of asthma medications may be provided to the student.

As Debbie described, there is also asthma education provided to the student by the HCP that happens during the visit. Debbie explains, “But you have to do the education, well I try to do an education because I’m trying to prevent them coming back in that condition [worsening asthma symptoms] again.” Time constraints during a sick visit are a real concern of the HCPs, especially when it involves educating a student with asthma. As Debbie pointed out the 30-minute visit is even more of a challenge when obtaining a full medical history and providing asthma education during the busy season (December through March) for asthma flare-ups. Bill offers the following, “This may sound bad...but, the way medicine is today, you can’t go looking for problems all the time. We just don’t have the time, and if we did that, we’d be here 24 hours a day doing it.” Bill is finding it difficult to practice medicine that benefits the patient with optimal care and the necessary medications due to the constraints placed on him as an HCP by the increased cost of medications and time limitations for each sick visit encounter with a student.

In addition to time constraints, there are some caveats to the typical in-take process shared by the HCPs. Gabrielle shares her insight,

And so, if they’re [student with asthma] worrisome to the nurse in any way or they meet a certain number, which I actually would have to look and see what that is, then the doctor, the physician is called and goes from there.

Lilly provides her perspective of the in-take process including the patient assessment that occurs in the nurse triage area,

The student might go through nursing triage, and what our RNs do is they look at the patient, and they do part of the assessment while they're talking to them. They might listen to their lungs, I'm not sure that they do that every time, but that's when it seems like it might be kind of like a really urgent situation. I'm not 100% sure that the nurses always listen to their lungs.

Lilly has concern regarding the inconsistent training of the nurses in performing peak flow measurements on asthmatic students; she continues,

And the peak flows are performed by the nurse. So, the assistant is the one that does that and so, we don't know that they've all been trained the same way or put the same effort into teaching them how to do it.

Pam reiterates, "The nurses in triage don't listen to their lung sounds. They just do vitals, peak flows and if the patient's past medical history has been asthma, they'll do the peak flows and obtain the [asthma history] forms." My analysis of these data shows there does not seem to be a consistent protocol that is followed for asthmatic students, and the fact that some of the HCPs at the SHC do not know if the nurses and nurse assistants are trained sufficiently to adequately assess (listen to lung sounds and proper performance of peak flow measurements) asthmatic students is problematic. This issue of an inconsistent protocol to assess asthmatic students dovetails with my earlier finding of inconsistency in care and communication with the SHC that the student participants identified.

Unfortunately, I do not have the data to provide an explanation as to why the HCPs do not know about the staff (nurses and nurse assistants) and their level of training for assessing (lung sounds and peak flow measurement) of an asthmatic student. The data I do have to aid in understanding the issue of the lack of a consistent protocol and lack of

staff training is from my post data collection personal conversation with the medical director. The medical director talked of implementing a “team approach” soon which would address patient assessment skills and treatment of asthma for all staff at the SHC. The team approach would include all the staff involved with the in-take process of an asthmatic student. Once a team approach is in place most likely a more strident protocol will be developed for students who come into the SHC complaining about asthma symptoms such as shortness of breath, wheezing, and coughing.

A Very Difficult Population to Deal With: Healthcare Providers’ Perspective

One of the major goals of the SHC, as stated on the university’s website, is to provide high-quality, accessible, and inclusive health care services to meet the needs of students. However, my analysis shows the task to provide high-quality health care services is complicated by difficulties that arise when managing a population of college students with asthma. It is my interpretation from the data the HCPs want to do the right thing in providing optimal asthma care to students. In addition, all the HCPs interviewed agreed college students with asthma are a difficult population to manage effectively. Bill explains, “It’s a very difficult population to deal with for all medical issues, not just asthma. You know, Mom and Dad always took the lead and told them what to do.”

Gabrielle shares,

Making asthma one of the topics that as a practice, we identify what our goals are, and what we’re trying to do, and what the appropriate treatment is, and what the appropriate outcome [should be], and going through that as a group, put it on everyone’s radar. And I think it was very helpful to me as a practitioner and also just the right thing to do.

The HCPs in this study are invested in improving the care for asthmatic students on campus. In addition, they want to do the right thing in establishing goals for appropriate asthma care, which will lead to better patient outcomes. One primary stumbling block in providing optimal asthma treatment and management from the HCPs' perspective was revealed in the data. The stumbling block revealed is the denial of asthmatic students about the chronicity of their asthma. The data reveal students do not view their asthma as a chronic disease, but they see it as an issue that develops only a few times a year. Pam shares her experience of a typical student's response regarding denial of his or her asthma diagnosis, "Oh no, but I had asthma only as a child, I don't have it anymore. They don't want to perceive it as a chronic disease." Gabrielle adds, "I think they really look at it as, this is a flare, okay, got it taken care of, and it's out of the mind again." She continues,

It's only when I'm sick and it's only when I do exercise." That chronic thing is not really on a lot of people's minds. A lot of my patients say "no, I never have asthma, except oh, when I'm sick or this season.

And, since some students may only see a physician a few times a year for an asthma flare-up it is the perception of the HCPs that students have no urgency in establishing a relationship for asthma care with an HCP on campus or with their primary care physician back home, if they have one. Two of the HCPs had the following comments related to this topic. Bill comments,

A lot of them have been seeing their pediatrician. Now they've aged out of their pediatrician and they haven't established with anybody specifically back home yet. And because to them their asthma is not a problem, it's a sporadic sort of thing. They're not going in to establish beforehand, they were going in for their

urgent care visit.

Pam adds,

I think it's a perception of pediatricians, telling parents, oh yeah, six years, they will be out of their asthma, and they should be fine after that, and I think that is the perception a lot of parents are told. And that's what they've told their kids.

It is an uphill battle that practitioners face in establishing a trusting relationship with students with asthma.

Debbie provides additional comments, "I think that my overall perception is that it's mostly acute care in response to exacerbation, with exception, there are a few, but for the most part it's coming when there's a concern [i.e., worsening asthma symptoms]."

Bill shares his experience encountering asthmatic students who deny they have asthma,

The students don't know if they have asthma. They may think they have outgrown asthma, or they never got diagnosed with it. Some people, maybe they're really an allergy-induced type asthmatic, and they never had a problem 'til they came out here and now all of a sudden, okay, they're just putting it to allergies, something like that.

Pam reiterates what Bill is describing in his experience with students being in denial about an asthma diagnosis; Pam explains, "Oh, I have upper respiratory infection, I have bronchitis, I have...you know, or whatever is going on at that time, flu or...but, asthma is the last thing on their mind." Similarly, Lilly comments, "It's seasonal, that they outgrew it. They had it as a child, but then they outgrew it." And Debbie offers her experience, "Learning to self-manage? I just think it's more reactionary . . . they don't understand the chronicity of it and the long-term potential effects." Debbie refers to the

chronicity of asthma in educating asthmatic students during a sick visit; she explains, “I show them the ongoing plan of care, that it’s a continuous cycle, and then I have them read with me [from the asthma guidelines] the two focuses, reducing impairment and reducing risk.” These data indicate that students who deny their asthma are more difficult for the HCPs to treat and manage effectively when compared to the students who have accepted the chronicity of their asthma. Furthermore, the HCPs are truly concerned about the student who is in denial about his or her asthma diagnosis or the chronicity of asthma. This lack of knowledge and understanding of the chronicity of asthma on the part of the student leads to non-compliance with their physician prescribed asthma treatment plan which can lead to poorly controlled asthma, which subsequently results in daytime and nighttime asthma symptoms. Pam explains,

I see in a lot of students because the moment they come in with wheezing during allergy season most of them are not ready to accept the diagnosis; they’re in denial. “Oh no, but I had asthma only as a child, I don’t have it anymore.” And I think that is the main perception I’ve been getting from the students. They don’t want to perceive it as a chronic disease, that this is something they would have to do while they’re here four years, the treatment plan... most students are not ready to accept the diagnosis, they’re in denial.

Additionally, Bill comments on this issue,

A lot of times, it’s a self-declaration because if they come in and they feel they’ve outgrown it [Asthma] and they come in for typical type stuff and they’re not on any [Asthma] medications because they’ve outgrown it, we have to ask the question, do you have anything from your past history? If they don’t tell us about

it, a lot of times we won't notice it unless we're hearing the wheezing or it's a really bad case.

In addition, the HCP data assert this population is difficult to manage due to the cost of medications for the students, especially inhaled corticosteroids (Appendix L). A primary means the HCPs utilize to control an individual's asthma symptoms is through prescribed inhaled medications, such as corticosteroids and bronchodilators (Appendix L). Bill explains,

I can't give them the meds they need even if they would take them because the cost is outrageous. Steroids, especially the combination medications [corticosteroid and bronchodilator], 100 bucks plus...with insurance at times and then all the rigmarole we've got to go through to get it approved.

Lilly offers, "We have a lot of uninsured patients or underinsured patients and so, being able to do it, that's a huge constraint; \$100 a month means a lot, or \$200 a month, or whatever it is." Students without medical insurance coverage represent a real challenge for the HCPs to provide optimal medication therapy for asthmatic students. Debbie also confirmed her students refuse to pay for expensive steroids if they do not have insurance.

The data reveal that both the HCPs and students recognize the cost of asthma medications contributes to the difficulty in effectively treating and managing asthma on the college campus. In addition, my analysis shows the cost of asthma medications may be tied to an asthmatic student's lack of understanding of the chronicity of asthma, meaning, the student may be less likely to agree to purchase the corticosteroid medication if he or she does not understand the role of the corticosteroid in controlling airways inflammation (the underlying chronic issue in asthma). Furthermore, the perception of the

HCPs of students who have not taken full responsibility for managing their asthma during their college years is problematic. Bill's comment dovetails with this issue,

Students, they don't know what they don't know. Also, even if they know yeah, I had trouble with asthma, I had to take this inhaler all the time, it's a lucky break if they know what medication they were on.

Bill goes on to say,

Most of the time I won't see them [students] coming back [for a follow-up asthma appointment], and we do give them the option of, somebody needs to manage your asthma. That can be us here [SHC], and we'd be more than happy to do it, or that can be with your primary care doc back home who you already have a relationship with.

Taking a closer look at Bill's comment, "somebody needs to manage your asthma", it seems to imply the HCPs, or another provider are the ones to manage it. But, from an adult learning/education standpoint it is the adult patient who needs to manage his/her asthma. Lilly explains the protocol for contacting a student with asthma to schedule a follow-up appointment,

We'll do a combination of things. So, the first thing is either a phone call or a message to the portal, and we get a read receipt if they've looked at the message on the portal, so we know if they've seen it, but say that...what I'll do is I'll tell my nurse, check for a read receipt for this message I just sent to the patient that they need to come in. So then, she'll check, and I'll say, if they don't read it, I want you to call them. So, then she'll call, so she'll document the call and whatever happens, she might leave a message and then route it back to me so I

can say, okay, let's wait and see if they call back or not. And then if they don't call back, then we'll make another attempt. And so, when it's really serious, we'll actually send a certified letter. So, whatever the problem is. We say, this is important, and we need to take care of your asthma.

Bill's and Lilly's comments about scheduling a follow-up appointment and getting asthmatic students to show up is part of the difficulty in managing a college student's asthma. And, Lilly's explanation shows the HCPs put forth much effort to schedule a follow-up appointment with a student whose lung function needs to be reassessed after a given time period has passed from the initial sick visit at the SHC. This gets back to the issue of an overall approach to managing asthma and who is ultimately responsible. My interpretation is that there needs to be a partnership between the HCP and student, with the adult student/patient ultimately being responsible.

It is clear that the HCPs in this study understand that some of their student patients have not fully transitioned to adult roles, which includes making health care decisions independent of their parents. Furthermore, as I progressed through analysis of the data it became apparent to me some of the HCPs may not know the population of students with asthma on campus as well as they could. As previously mentioned, the HCPs perceive students with asthma as a difficult population to manage due to their inconsistent management of their illnesses and visits to their HCPs; however, these HCPs also believe that most students seeking treatment for asthma at the SHC are traditional age students who are not prepared to take accountability for their illness's management. The student participants in this study ranged in age from 22 years to 57 years. The HCPs focus is to develop an appropriate treatment plan for a student who is transitioning into an

adult role (i.e., the 22-year-old participant in this study) and has not accepted full responsibility of managing their asthma versus an older student (i.e., the 57 year old participant) who is making all of his/her own health care decisions. The data reveal the importance of knowing the population of students with asthma in terms of who is taking full responsibility for health care decisions and who is transitioning to an adult role and who remains dependent on his or her parents to make health care decisions.

Debbie shares her experience with students managing responsibility for their healthcare; she states,

Students may be walking into the student health center for the very first-time seeking treatment by themselves without a parent to guide them. The parents are still very much a part of their healthcare, but yet they're trying to learn and navigate their healthcare.

As an example, student participant Amy is 24 years of age, and she remains dependent on her mom to text her the daily allergen report; her mom is very much a part of her healthcare. In contrast, the student participant Jamie is 57 years of age and is making health care decisions on her own. For example, she schedules regular asthma checkups at the SHC, knows her asthma triggers, reads asthma literature the doctor provides to aid in preventing an asthma flare-up, and desires to establish a trusting relationship with the doctor. An example of a younger student who shows adult characteristics in managing her asthma is Andrea, a 22 year-old. She sticks to her doctor prescribed asthma treatment plan, she is aware of her asthma triggers, and takes a preventative approach to self-managing her asthma like being fastidious about hand-washing to prevent contracting a cold virus, which triggers her asthma. The HCPs' ability to identify where students are on

a continuum of personal investment and accountability in reference to making adult independent health care decisions versus someone who is transitioning to an adult with independent health care decision making skills is valuable tool in the development of an appropriate asthma treatment plan that the student will agree to and comply with over time.

In addition, Lilly and Pam are concerned that students with asthma will stop following their prescribed treatment plan and possibly risk experiencing increased asthma symptoms. Lilly explains her thoughts on the mindset of a student with asthma and how she perceives the situation,

I think we make more effort than they do to follow up on a plan and so, I think literally the mindset is, they're busy, they don't want to spend money on an office visit. They've got to go to class, they want to do something more fun than come into the doctor's office and deal with their asthma. So, how do we motivate them to feel like this is something that's important and helpful to them that will make them feel good.

Pam expands her thoughts on the primary care concerns she has when caring for and treating a student with asthma,

I think the biggest primary concern for us is students following their treatment plan, which we don't see it happening. Then, insurance, financial wise, not being able to pick up their medications. And even understanding the concept that there are allergens here [in the local geographic area] which are going to trigger you for years and you're going to have asthma and how to plan for it.

Related to the concerns mentioned by Pam and Lilly is the difficulty that the HCPs have

in contacting and communicating with students when they are not following the advice of their HCP to schedule a follow-up appointment after being seen previously at the SHC for an asthma sick visit. The SHC has several ways to contact a student regarding follow-up asthma care by the HCP.

Additional factors contributing to the HCPs' perspective of the difficulty of managing this population of college students are the HCPs' perception of the ineffective strategies asthmatic students employ to cope with asthma. Pam has her opinion of the ineffective coping strategies of asthmatic students, "The way they cope is basically come in when they're sick. So, for them, coping is, if I'm sick, I go in, but making lifestyle changes, not a lot." HCPs continually mentioned students are too busy and too stressed to adequately self-manage their asthma; they tend to delay seeking treatment for their asthma symptoms until the symptoms get too bad, for example, their breathing limits their daily activities such as attending classes or going to work. As revealed in my literature review, if students are not able to recognize the symptoms of an impending asthma flare-up this could lead to a severe, life threatening event. Gabrielle comments on the ineffective coping of asthmatic students saying, "They're not coping with it very well. Some go to the extreme where they're scared out of their mind." Debbie's perception is as follows, "Well, I think they cope by adjusting to limitations and their breathing quality and even if it means not getting out as much. Their breathing quality just isn't well enough to participate in activities." And Bill's concern is the student's mindset of using only a quick relief inhaler to cope with his or her asthma symptoms; he explains, "students have their albuterol on hand, just use it as needed." Bill continues, "They're hitting albuterol three times a week, well they had been doing it five times a week, so I'm

in pretty good shape. That's just the way it is." The HCPs seem to agree the coping mechanisms of asthmatic students are not optimal in achieving effective management of their asthma which puts them at risk of worsening asthma symptoms. It is my sense the HCPs are truly concerned the asthmatic students are utilizing ineffective coping strategies which adds to the difficulty in the HCPs management of this population of college students. Ultimately, the HCP perception is that students have learned to live with and cope with poor breathing quality and so thereby treating their asthma as a sporadic issue, which in the students' minds is something only to be addressed when it gets bad, such as with shortness of breath which limits their daily activities.

The HCPs also believe that some students are poor perceivers, that is, individuals who are unable to determine the meaning in terms of the severity of their asthma symptoms. Bill comments on this subject; he states,

I find that a lot of students don't recognize that, okay, you really are having symptoms, or they don't think they're having symptoms because that's how they are every day. That's their perceived baseline whereas maybe we can make it better if we institute these procedures, medicines, that sort of thing.

Gabrielle's assessment of students who are poor perceivers of asthma symptoms is summarized in her statement,

Asthma only happens when students do certain things, and if they don't do it, it won't happen or that it's about the activity rather than them, some kind of weird existential thing, like the asthma is happening outside of them.

Regarding the misconception of students not being able to control their asthma Gabrielle states,

If you presented the information in the right way, it would allow people to make that next step of managing their asthma better and adhering better because they would feel less a victim and more in control of this process than they currently think they are.

Gabrielle's comment, "If you presented the information in the right way", gets to the crux of the situation of better asthma self-management. It is clear the HCPs at the SHC are continually asking "How can we present information on asthma education in the right way?"

The findings reveal the HCPs are the primary "asthma educators" within the SHC and are charged with dispelling these and other misconceptions students have about properly managing their asthma. Gabrielle emphasizes this in her comment, "The misconception is that their allergies are not related to their asthma, that asthma is different from allergies in some way, that asthma will go away, that it went away." Similarly, Pam states, "I think the biggest misconception is thinking allergies are not what's causing the asthma, it's probably they got sick because of a friend, they got sick because somebody else was sick in their class or their roommate." The use of a rescue inhaler is the standard for treating acute asthma symptoms; however, the HCPs' perception is that asthmatic students lack the understanding of the role that inhaled medications play in controlling asthma flare-ups thereby creating misconception among students in how asthma medications work to provide relief from asthma symptoms.

To conclude this section on the difficulties in dealing with asthmatic students, it is clear that HCPs are concerned that asthmatic students harbor many misconceptions about their asthma including a lack of belief in the chronicity of their asthma, the belief they

have outgrown asthma, their utilization of ineffective coping strategies, a lack of knowledge about the role airborne allergens have in triggering an asthma flare-up, and the lack of understanding of the role inhaled medications, especially corticosteroids, play in controlling asthma flare-ups. In addition, the data show the need for educating asthmatic students about the anatomy and physiology of the upper airways (nasal passages and sinuses) and lower airways (lungs) and how these anatomical structures connect and the role they play in the management of allergies and asthma. HCPs know that these misconceptions act to hinder an asthmatic student in recognizing his or her asthma symptoms thereby delaying early intervention and possible prevention of a severe asthma flare-up. Furthermore, the HCPs recognize students who deny they have asthma or are convinced they have outgrown it only contributes to the difficulty in managing this population of college students. And lastly, it would behoove the SHC to establish a systematic method of identifying which students on campus have asthma. Gabrielle comments, “Setting forth a protocol we’re going to identify students who have asthma.” If the HCPs do not have a protocol in place to identify which students on campus have asthma, it places those unidentified asthmatic students at risk of missing out on the resources for proper asthma management found at the SHC.

Teaching Students About Their Asthma: Educating, Monitoring, and Managing

The HCPs place an emphasis on the importance of educating asthmatic students during an encounter at the SHC. In addition, the HCPs utilized a variety of written asthma education materials to reinforce the teaching of basic asthma care concepts to asthmatic students. Furthermore, the need for appropriate student self-management of asthma is evidenced across the HCPs’ data. And, students on campus are struggling to

effectively self-manage and monitor their asthma during their college years.

The data reveal the importance of students learning that while asthma symptoms occur intermittently, this does not indicate their asthma has gone away. Pam adds the following, “Students that have really learned to self-manage have been the ones who have accepted they know that this is their asthma causing it.” The providers know that students who deny the chronicity of asthma are doomed to experience worsening asthma symptoms, be at risk for a life-threatening asthma flare-up, and decreased quality of life. Alternatively, as students accept the chronicity of their asthma they then will cultivate a desire to learn how to effectively self-manage their asthma during their college years.

Pam educates her student patients by explaining, “What are your asthma triggers, [and then explains] how to look out for those triggers and we want to make sure you know how to use your corticosteroids or how to use even simple thing as Singularir.” Debbie establishes goals with the student based on the national asthma guidelines; she teaches students by explaining,

These are our goals [referring to the goals of the asthma guidelines], and then I tell them what the recommendations [from the guidelines] are. I print out the literature to show them that I have a framework I’m working off of and that I go down a list, and I’ll try to expand their understanding as we go, and then I’ll show them even how I arrive at my treatment plan. And then I’ll show them the dosing patterns for the steroids.

Because Gabrielle often sees students “always rescuing...and they always seem like it’s chasing them,” she emphasizes the role of asthma medications to students. She explains, “I try to get them [students] to understand that taking a medicine when you don’t have

[asthma] symptoms and correlate that's why you don't have symptoms is because you're taking the medicine can sometimes be very difficult." Pam conveys her approach to asthma education during a sick visit in which she explains to students with asthma, "We talk to them this is maintenance, this is what you need to do. We want to make sure you know how to use your corticosteroids." As difficult as it is, the HCPs are cognizant of the importance of students learning the role of medications in controlling asthma symptoms.

My analysis of the HCPs' data reveal they are educating and training the asthmatic students the best they can in the short amount of time they have during a sick visit with the students. The comments by Bill, Pam, Gabrielle, and Debbie reveal they are committed to educating the students about the chronic nature of asthma and how that relates to the daily management of their asthma to prevent a flare-up. The HCPs largely understand that asthmatic college students do not understand asthma as a disease of the lungs that has life-long implications for their health and well-being, that these students do not believe in the chronicity of asthma, or they choose to deny their asthma is more than a sporadic problem that surfaces a few times a year. Asthmatic students are not always focused on their asthma during college, understandably so because they are concentrating on academic coursework and college related activities. Indeed, students are in denial their asthma is a condition that needs to be properly self-managed and self-monitored on a weekly if not daily basis to prevent worsening asthma symptoms.

In addition, educating students how to effectively self-manage their asthma also includes monitoring their asthma using a peak flow meter (Appendix L). Bill recommends students establish a daily routine of measuring their lung function via a peak flow measurement. Bill states, "What we would have them do is doing the peak flows on

a regular basis since I try to educate them that that's going to decrease [peak flow measurement] before they start feeling that it is decreasing." Bill continues, "And we try to educate them about the physics of airflow through the bronchioles and the trachea and such." Debbie also concentrates on the importance of monitoring with peak flow measurements,

After I teach them about it [peak flow measurement] and tell them that the peak flow readings are an indicator of declining lung function before symptoms ever start, that you know when they're having trouble at the moment, that sounds real interesting, I'd like to prescribe one for you and show you how to use this and they're interested.

Gabrielle and Lilly also use monitoring peak flow readings as a teaching tool for students. Gabrielle explains,

They [asthmatic students] don't know how to do better until they come for a few visits, and then you see that their peak flows are great, and they're not having [asthma] symptoms, and the daily steroid inhaler is working, and they feel better. So that's the thing about it is that this practice, you see a lot of people can take what you tell them, use it and get healthier.

And Lilly states, "Then we've got the asthma action plan, it's that red, yellow and green and what to do if you have these symptoms versus or if you have these [low] readings on your peak flow meter."

Each provider has a different approach for educating asthmatic students about how to monitor their asthma and the importance of adhering to the prescribed treatment plan to keep them breathing well and thereby minimizing student limitations to physical

or social activities. Peak flow monitoring is a priority for most of the HCPs in teaching asthmatic students how to effectively self-manage and monitor their breathing daily. Furthermore, the HCPs' data reveal the providers recognize each student may have different educational needs. For example, Gabrielle attends to educating about the role of corticosteroids and how these medications reduce airway inflammation. Bill's approach emphasizes monitoring of asthma symptoms via the objective measure of peak flow. In addition, he spends time to educate asthmatic students on airway anatomy and physics of airflow to demonstrate how the lungs function. My overall analysis of this HCP data is the providers are doing their best to individualize their asthma education approach depending on the educational needs of an asthmatic student. Furthermore, the HCPs use their time with the asthmatic student to facilitate the student's understanding of a global perspective of his or her asthma to include asthma triggers, monitoring symptoms via peak flow measurements, the role of asthma medications, and how to avoid an asthma flare-up by adhering to the prescribed treatment plan.

This section focused on the data which revealed how the HCPs went about educating asthmatic students regarding the importance of proper asthma management including daily monitoring with peak flow measurements and the role of medications in preventing an asthma flare-up. Furthermore, I learned which asthma education materials were used by the HCPs to educate asthmatic students visiting the SHC. The patient education materials on asthma or asthma resource websites that were utilized by the providers at the SHC and that I learned of from my observations of the HCPs are as follows:

- Asthma Action Plan from the SHC's EMR;

- Asthma and Allergy Foundation website (www.aafa.org);
- Clinical support database website (www.uptodate.com);
- Comprehensive clinical information and resources (www.medscape.com);
- Written brochure on asthma;
- National Asthma Education and Prevention Program guidelines (NAEPP, 2007);
- Patient education written handout on asthma from the SHC's EMR;
- Written information on Exercise Induced Asthma from the Sports Medicine Patient Advisor (Rouzier, 2000).

As presented in the following paragraphs, each HCP had their preference for which patient education material he or she used during an encounter with an asthmatic student. My analysis shows there is inconsistency among the HCPs in the type of asthma literature given to students and how the literature was distributed to a student. Gabrielle, Lilly, and Pam mentioned they give students a printed copy of the patient education handout from the SHC's EMR to aid students in learning about asthma. Gabrielle states, "Our software has some options of patient education handouts." In addition, Lilly gives the student a one-page handout; she explains, "From the EMR we can send that [patient education material] to them, and I tell them, we're going to send you this information. I want you to look it over and contact me with any questions about it." Bill states he gives the student a written asthma action plan; he explains,

I fill in the numbers for their peak flows. I also then circle at the bottom, we have all the different types of medications and options there, so I'm highlighting for them there, which ones they're on and who to contact.

Furthermore, Bill utilizes an online database called the Sports Medicine Patient Advisor

(Rouzier, 2000); he explains,

With sports medicine, I have a large database of different handouts that I give and one of them is based on exercise induced asthma by the Sports Medicine Patient Advisor by Pierre Rouzier, who's a primary care sports med physician.

Debbie, Pam, and Gabrielle utilized asthma information from the national asthma guidelines or from reputable online sources, such as www.uptodate.com or the Asthma and Allergy Foundation at www.aafa.org, to educate the students during a sick visit at the SHC. Two of the HCPs also engage in direct, explicit instruction during sick visits about how students can better manage their asthma. Debbie teaches using the national asthma guidelines during the sick visit, she explains,

I teach the students about environmental triggers, and then I review the overall plan of care with the National Institutes of Health. I use the Asthma Quick Reference Guide, and then I pull out the categories [asthma severity categories: mild, moderate, or severe asthma] and show them where they fit in, try to get them familiar with these five questions we use in our asthma questionnaire.

Debbie is using the national asthma guidelines to demonstrate to the student that her decision to treat the student's asthma is based on the recommendations of these guidelines. However, Debbie also shared during the interview that, "I feel we need more teaching materials." In addition, Pam takes time during a sick visit with the student with asthma to teach via verbal instructions from an online source such as www.uptodate.com, which is a clinical decision support resource. Pam uses the evidence-based asthma research from this website to reinforce her decision for the medications she is prescribing to treat the student's asthma. Pam explains, "Usually we try to do outpatient education

literature; we will pull up something from Up to Date or Medscape or something.” The data show the HCPs use the asthma literature as their ‘asthma curriculum’ to aid in teaching the students which helps students better understand their asthma and how to self-manage it better daily.

In addition to educating students how to self-manage and monitor their asthma to prevent an asthma flare-up, the HCPs were very aware that an asthma flare-up could result in a student’s death. The HCPs’ primary concerns for caring for students with asthma were related to the students’ ability to avoid a severe life-threatening flare-up and thus prevent student deaths. Bill comments, “My primary concern is to make sure we reverse the situation and get them out of any potential danger zones.” Lilly shared her experience of a child’s tragic death from asthma, “Prevent death, that’s a big one. I witnessed a death by asthma in an emergency room in a 13-year-old girl.” My analysis reveals the HCPs have knowledge of the seriousness of asthma flare-ups and the dire consequences for students who do not follow their physician prescribed asthma treatment plan. The data clearly shows the HCPs are acutely aware of the potential life-threatening risks of asthma and the reality of a student dying on campus from an acute asthma flare-up.

Summary of the Healthcare Providers’ Perceptions

In conclusion of this section, the HCPs’ data reveal a truly committed group of healthcare professionals whose collective goal is to improve the health and well-being of students including those with asthma on campus. Lilly’s comment reveals her level of commitment to improving the health of college students; she explains,

So, I’m very, very committed to all things that are prevention related. And so, if I

could save somebody a trip to the ER or save them from developing cancer or death for any reason, I want them to have a long and happy and healthy life and be all they can be.

In addition, the HCPs assert they are dealing with a difficult population in college students with asthma. The HCPs know college students with asthma are hampered by factors they have never had to deal with before such as being on their own and for some of them making independent healthcare decisions for the first time. However, it is critical to note that my findings showed the HCPs did not mention non-traditional students (students over the age of 24) on campus, nor any students who were appropriately managing their asthma when discussing asthma care and treatment at the SHC. The data showed the concern about the inability of students to pay for appropriate asthma medications, due to the exorbitant cost of the medications, hampers adherence of the student to the asthma guidelines recommended treatment plan. An additional factor is the HCPs' belief that students are utilizing ineffective coping strategies, such as overusing their rescue inhaler, to deal with acute asthma symptoms daily. Furthermore, each of the five HCPs have recognized the limitations of their formal medical education programs in fully educating and training them in the treatment and management of asthma for college students.

Educating asthmatic students on the basics of what triggers their asthma and what happens in the lungs during an asthma flare-up can be aided by literature on asthma provided to the student. The HCPs provided their perception of the asthma literature they have access to and distribute to students who come to the SHC for asthma care. The following are themes revealed from analysis of the data which show the perceptions and

concerns the HCPs have regarding the education of asthmatic students, (a) the HCPs are passionate about educating students with asthma, (b) more time is needed for asthma education during an encounter between the HCP and the asthmatic student, (c) more college appropriate teaching materials on asthma are needed at the SHC, (d) the HCPs' clinical decisions are reinforced by the national asthma guidelines' recommendations for the education and management of asthma, and (e) students need access to college level asthma education materials to aid them in the self-management of their asthma.

The HCPs reveal how they have learned about the treatment and management of asthma. They recognize their formal medical education curriculum was not sufficient in becoming knowledgeable and proficient in the clinical practice of asthma management. As a result, the HCPs learned by experience as they engaged in the practice of medicine by diagnosing, treating, and managing students with asthma on campus. The data showed learning from experience was the prominent learning method used by the HCPs in the treatment and management of asthmatic students on campus. In addition to learning from experience, the HCPs have learned about the diagnosis, treatment, and management of asthma in other ways including (a) through a formal medical education curriculum, (b) via self-directed learning through study of the national asthma guidelines and online clinical support resource databases, (c) by clinical training in a medical residency program, and (d) through attendance at continuing medical education seminars.

The HCPs' data are essential in contemplating the real issues in managing students with asthma on the college campus. To summarize, the following shows the salient themes I have discovered through analysis of all the HCP's data:

- most of the actual learning about asthma treatment and management has

occurred through the experience of the day-to-day practice of medicine treating and managing asthmatic students at the SHC on campus;

- the HCPs recognize the need for additional training for the SHC staff (including the HCPs) in the performance and interpretation of lung function testing (i.e., spirometry and peak flow) on asthmatic students;
- the challenge of providing optimal asthma care for students at the SHC is influenced by time constraints for each student's sick visit and the exorbitant cost of asthma medications;
- students who deny the chronicity of their asthma will be more vulnerable to the limitations brought on by asthma symptoms;
- a consistent protocol has not been established for the SHC staff (nurses and HCPs) to follow in assessing, treating, and educating the asthmatic student;
- identifying which students on campus have asthma is a key component to effective asthma care;
- establishing a trusting relationship during an encounter with the student and HCP is key to effective asthma management;
- a consistent communication method to deliver student health information and scheduling of follow-up visits for asthma care is lacking;
- a goal of the HCPs after an asthma flare-up is return the asthmatic student to normal daily activities;
- provide students with the education and necessary tools for proper self-management of their asthma to facilitate compliance with their asthma

treatment;

- some students do not take full responsibility for managing their asthma;
- some students are in denial about the chronicity of their asthma which may affect their compliance with prescribed medication therapy; and,
- the HCPs are concerned for all asthmatic students in the prevention of a severe life-threatening asthma flare-up or death.

The salient themes described here are important because they are indicators of the areas of improvement needed for the effective delivery of asthma education and management by the HCPs at the SHC on campus. For example, if there is no reliable method available to identify which students on campus have an asthma diagnosis, then the HCPs do not have the opportunity to aid in the care and treatment of that subset of students with asthma. Effective shared decision-making (discussed in chapter V) between the students and the HCPs may ultimately influence the students' compliance with their prescribed asthma treatment plan. And, if there is not a trusting relationship between students and HCPs then it may be difficult to achieve the goals of the SHC, which include the prevention of severe life-threatening asthma flare-ups or the death of a student. In addition, the findings also point to some students and their transitioning to adult roles marked by taking on more responsibility for asthma care and treatment. However, even though traditional college students make up a portion of the student body and are included in this study, non-traditional students with asthma, and younger adult students who have begun to take responsibility to manage their illness, are on campus as well, yet the HCP findings seem to indicate that these providers do not know about or acknowledge these students at all. Lastly, students who deny the chronicity of asthma

will be more vulnerable to the limitations brought on by asthma symptoms and thereby have less than optimal lung function needed to complete their daily activities. The HCPs' perceptions are important indicators for the improvement in the care and treatment of students with asthma on campus.

Part III: Conclusion

This chapter answered the three research questions which addressed how asthmatic college students learn to self-manage their asthma, the strategies they employ to cope with asthma, and the perceptions of the HCPs employed at the SHC regarding the status of asthma education and management on the college campus. Furthermore, the data for the participants reveal how the students and HCPs learn from experience about asthma. The students learned through experience about how to cope with asthma while enrolled in college. And, the HCPs learned from their day-to-day experience how to treat and manage asthmatic students based on these experiences. The students and HCPs recognize there are some significant challenges on campus which hamper the effective treatment and management of asthma and there is lack of a protocol for the assessment, diagnosis, and treatment of asthmatic students at the SHC that needs to be addressed to improve asthma care. It is my hope that the research findings here will contribute to improving the asthma education, care, and treatment of students who visit the SHC on campus. The desire of students wanting to learn more about their asthma and the HCPs commitment to improving asthma education and treatment at the SHC is a combination that hopefully will lead to better outcomes for asthmatic students.

In the next chapter I will provide a discussion of the notable findings of the data and provide a discussion of the implications of this study for theory, education practice,

and policy. In addition, I will discuss the following regarding this study: limitations and delimitations, ethical concerns, and future research recommendations.

V. DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS FOR FUTURE RESEARCH

This qualitative instrumental case study examined how students with asthma learn from their experiences during their college years and the strategies they used to cope with their asthma daily. In addition, this study examined the perceptions of the HCPs employed at the SHC regarding the current state of asthma education and management on campus. A large, public university and its student health center located in the southwest region of the United States served as the real-world context for this case study. The theoretical framework from which I structured this study was Kolb's experiential learning theory (ELT). ELT is defined as, "a naturalistic ongoing process of direct learning from life experiences contrasted with the systematic learning of formal science and education" (Kolb, 2015, p. xx). Kolb's ELT theory helped me to explain how the asthmatic student's and the HCP's experiences were transformed into learning (Kolb, 2015, p. xxi).

The unit of analysis for this case study was a large public university located in the southwest region of the United States. The units of observation consisted of students with asthma and the healthcare providers and the SHC documentation/processes. The participants consisted of five, full-time students who had a physician diagnosis of asthma and five HCPs who were employed full-time at the SHC on campus. The research questions guiding this study include: (1) How do college students with asthma learn from their experiences in the self-management of their asthma during their college years? (2) How do college students cope with their asthma on the campus? and (3) How do healthcare providers on campus perceive the current state of asthma education and management of college students on the campus?

In chapter four, I outlined the findings to respond to my three research questions and provided insight into the lived experiences of the student and HCP participants. The first research question addressed how students learn from experience about self-managing their asthma and the second research question assessed the coping strategies utilized by college students living with asthma on a college campus. The findings of this study revealed the physical landscape of the campus contributed to the challenges of students in coping with their asthma due to the hills, extreme weather conditions (high heat and humidity levels), and many outdoor airborne allergens (grass pollen and tree pollen) of which some may be foreign (due to the university being located some distance from her hometown) to a student's immune system and thereby serve as asthma triggers for susceptible students. Through the narratives of the asthmatic students, I discovered they learn from experience about how to cope with and self-manage their asthma while in college. However, I found the students are not always confident in their asthma self-management skills and need additional education and training in the following areas: (a) proper use of asthma medication delivery devices, (b) knowledge of the role, risks, and benefits of asthma medications, and (c) the pathophysiology of asthma. In addition, I discovered how students were adapting their lives and learning from experience to cope with their asthma on campus. The third research question was directed to the HCPs at the SHC, namely, "How do HCPs' perceive the current status of asthma education and management on the college campus?" With analysis of the HCPs' data, I found the HCPs recognize their own need for additional education and training in the treatment and management of asthma as outlined in the GINA and NAEPP asthma guidelines. In addition, the HCPs expressed they have learned the most about managing students with

asthma through the day-to-day experience of treating and managing asthmatic students. And, even though the HCPs have limited time to educate asthmatic students during an encounter at the SHC they are committed to preventing asthmatic students from a severe life-threatening asthma flare-up or death.

In this chapter, I provide a discussion of how this study's findings are situated within the existing literature, and the implications of this study including how it influences theory, education practice, and policy. In addition, the ethical issues of conducting this study are discussed. And lastly, I will provide a discussion of the limitations and delimitations of this study and future research recommendations.

Discussion of Notable Findings

The findings of the study are divided into the two participant groups: Five students with an asthma diagnosis and five healthcare providers employed at the SHC on campus. The notable findings of each participant group will be compared to the larger body of research as it relates to asthma education and management.

Notable Findings of the Students

In this section, I discuss how this study fits in with the larger body of research regarding students living with asthma on a college campus and how they go about learning about their asthma. The literature reveals that most students with a chronic illness, such as asthma, are learning to cope with and self-manage physical symptoms, psychological and emotional distress, financial burdens, and the transition to college life. The purpose of this study was twofold: Firstly, it examined how students with asthma learn from experience about their chronic illness, and secondly, which coping strategies are used by students to

self-manage their asthma on a campus that is hilly, hot and humid, and has many airborne grass and tree pollens which serve as potential asthma triggers.

As students with asthma transition to college the literature reveals that many are found deficit in the knowledge of how to self-manage their asthma (Unwin et al., 2013). In addition, the transition of young adults with asthma to college goes largely unaddressed which makes them a vulnerable population, placing them at risk for poor academic performance, increased risk taking, depression, and decreased quality of life (Levy, 2015). The findings of this study confirm with the larger body of research that some college students with asthma are ill-equipped to effectively self-manage their asthma during the college years. As stated in the NAEPP guidelines, the ultimate goal of asthma management is to “promote patient self-management, to reduce the impact of asthma on related morbidity, functional ability, and quality of life” (NAEPP, 2007, p. 96). The medical director and the HCPs on campus are focused on improving asthma care for students, and he is hoping this study will reveal some practical solutions to aid in improving asthma care including the diagnosis, treatment, and management of students with asthma.

Through my analysis of the students’ data, I have discovered some of the common problems relating to the ineffective self-management of asthma by the student participants was due to lack of the following:

- basic knowledge of how asthma medications work to reduce symptoms;
- knowledge and skills to properly deliver asthma medications to the lungs via an MDI with a holding chamber;
- understanding of the pathophysiology of asthma;

- access to affordable asthma medications, especially inhaled corticosteroids;
- adequate medical insurance coverage; and,
- acceptance of the chronicity of their asthma.

This list of deficiencies in students' knowledge and understanding of asthma point to the problem areas that need to be initially addressed. There is a need for students with a chronic illness to develop competence in self-managing their disease and to build confidence in advocating for themselves. The proper use of inhaled medications is an integral part of daily asthma self-management and therefore it is imperative that individuals with asthma are competent in the delivery of inhaled medications to the lungs to reduce asthma symptoms. During my interview with Kat, I found that she had been administering the same medication daily from two different inhalers; however, the two inhalers contained the same rescue medication (Albuterol). During the time after the interview I educated her on the two inhalers and stated they contained the same medication but with different brand names (Ventolin and ProAir), and they were both a rescue medication. For ethical care, I instructed her to return to the SHC to visit with an HCP to clear up this issue. I did confirm with an HCP at the SHC two weeks after this incident and was informed that Kat had returned to the SHC and the issue with the MDI medications was resolved. The study by Reece et al. (2002), of 215 students with asthma, found that participants with moderate to severe asthma were more likely than participants with mild asthma to have received education on inhaler use. This study's findings dovetail with the findings of my study in that none of the five student participants were aware of the need to use a holding chamber in combination with their inhaler for the

effective delivery of an optimal dose of asthma medication to the lungs. The fact Reece et al.'s (2002) study revealed the lack of basic asthma education for all students with asthma on a college campus, regardless of asthma severity, confirms the vulnerability of this population of students living with a chronic illness. The literature reveals improper management of asthma contributes to partially controlled symptoms including wheezing, shortness of breath, coughing, and sleep disturbances (Molzon et al., 2013). Partially controlled symptoms could be attributed to the lack of knowledge of the student participant about the differences in the role of asthma medications (bronchodilators versus corticosteroids) to treat and reduce symptoms, including which one to use as needed when she experiences shortness of breath and which one is a daily maintenance medication to suppress lung inflammation. Regarding assessing patients for proper use of asthma medications, the literature reveals for asthma management and prevention the national asthma guidelines recommend assessing a patient with asthma when they ask for a medication refill (GINA, 2018). One student participant in this study told the story of when she had asked for a refill of asthma medication from her hometown allergist's office, she was informed by the staff she would need to make an appointment to visit with the physician before he would refill a prescription for medication. Students with asthma who are new to the adult health care system are sometimes frustrated by the inconvenience of not being able to have immediate access to asthma medications. And therefore, the literature comments on the best practice guidelines which recommend a face-to-face meeting where the healthcare provider discusses the student's role in taking on responsibility for his/her health care and developing the skills needed to ready for transition to college and the adult health care arena (Beal et al., 2016).

Notable Findings of the Healthcare Providers

This study assessed the HCP's attitudes and perceptions regarding the current status of asthma education and management on the college campus. As a respiratory therapist and certified asthma educator, I wanted to learn how the HCPs on campus approach learning about how to best care for students with asthma and how they go about diagnosing and treating students with asthma at the SHC on the campus of a large public university. In addition, I learned which diagnostic devices were being used by the HCPs to diagnose and manage students with asthma and the literature that was being used by and/or distributed by the HCP's to reinforce teaching about asthma to the students.

In this section I will discuss how this study fills a gap in the larger body of research regarding asthma education and management on the college campus. This study discovered the HCPs at the SHC are in tune with and focused on achieving the goal of controlling the asthma symptoms of students and reducing their risk of a life-threatening asthma flare-up or even death. However, the HCPs commented that the lack of affordable inhaled corticosteroid medications makes effective management of students with asthma and reduction of their symptoms less likely because the students must choose between paying for asthma medications versus other living expenses. Bill, one of the HCPs, mentioned during his interview that he can follow the GINA asthma guidelines in developing an asthma action plan for a student, but if the student does not have the money to purchase the appropriate asthma medications or the student refuses to pay the cost of the medication then that student is at risk for developing daily asthma symptoms and the deleterious effects of not adhering to a physician prescribed asthma treatment plan based on the national asthma guidelines.

In addition, the GINA guidelines promote identifying the patient's own goals regarding their asthma and its treatment (GINA, 2018). Patient-level treatment decisions should consider any individual characteristics that predict the patient's response to treatment, together with the patient's preferences, and practical issues such as inhaler technique, adherence, and cost (GINA, 2018). Furthermore, these guidelines recommend assessing for treatment issues with each patient encounter to include watching the patient demonstrate use of his/her inhaler to check technique, check if the patient has a written asthma action plan and ask the patient about his/her attitudes and goals for asthma management (GINA, 2018). Lastly, the GINA guidelines state the aims are to reduce the burden to the patient and his or her risk of flare-ups, airway damage, and medication side-effects (GINA, 2017).

A partnership between the patient and his or her health care providers is important for effective asthma management (GINA, 2018). The literature reveals the transition from pediatric-based health care to an adult health care model requires a structured, comprehensive approach to improve the care of the college student (Unwin et al., 2013). It is likely that the transition from a pediatric physician practice to an adult-oriented health care system will require some purposeful planning (Lemly et al., 2014). The American Academy of Family Physicians, American Academy of Pediatrics, and American College of Physicians have provided recommendations for the transition of college students to an adult care model. The recommendations of these professional organizations include: "(1) a transition plan created by the student's current physician practice (sending practice), (2) clinician checklist for transitioning college students, and, (3) orientation to the adult healthcare model for the student by the college or university

health center (receiving practice)” (Unwin et al., 2013, p. 596). These recommendations certainly seem reasonable but would require the cooperation of the student, his or her parents, the student’s pediatrician, and an HCP at the student health center where the student will be enrolled in college. I wholeheartedly agree that in a perfect world a partnership between the student with asthma and the HCP at the SHC would be ideal. However, the findings of this study reveal the nature of the partnership between the student and HCP are complex. And therefore, I will advocate for an asthma checkup day at the SHC on campus during to introduce students to the HCPs and to document their asthma history and assess their lung function to establish a baseline before they develop an asthma flare-up. The HCPs conveyed to me during the interviews that students with asthma usually do not follow the advice of the HCP in scheduling a follow-up visit for asthma care. In general, the students showed respect for the HCPs during the interviews and stated they mostly utilized the SHC on campus for asthma care and treatment due to convenience and affordability, but if they had a choice, they prefer their asthma specialist back home. However, the students did speak very favorably of the HCPs at the SHC regarding the asthma care and treatment they received on campus during their college years.

In a related issue, the HCPs employed at the SHC are primary care providers and thus their knowledge of asthma is not on the same level as that of an asthma specialist (Allergist or Pulmonologist). In general, the findings from the interviews revealed three of the student participants did not view the HCPs at the SHC as their “primary care physician”; however, one student mentioned she considered one of the HCPs at the SHC as her primary care physician primarily due to her lack of medical insurance coverage

which limited her ability to be cared for by a primary care physician in the local community. This study revealed that four of the five student participants preferred their asthma specialists (Allergists) in their hometown to manage their asthma over the HCPs at the SHC. The literature may shed some light on this issue. One study revealed, “adult physicians (primary care physicians) feel unfamiliar with chronic disease as it is frequently a multisystem illness, so they tend to be more reactive to illness than proactive” (Srivastava, et al., 2012, p. 231). This same study found that adult physicians who have a future-focused approach, as opposed to being reactive to illness, better serve students with chronic illness (Srivastava, et al., 2012). Based on the findings of this study, I would characterize the HCPs who were interviewed as being partially reactive in their approach to treating students with asthma and partially future-focused. Based on my findings of the HCP data, implementation of the following at the SHC may aid the HCPs in moving toward a more future-focused approach to asthma education and management: (1) development of a standard asthma education curriculum, (2) written literature tailored to asthmatic college students on this campus, (3) training and competency in lung function testing for all SHC staff performing and interpreting the results of this procedure, (4) an individually prepared asthma action plan, and (5) education of and an update on the national asthma guidelines, GINA and NAEPP.

The denial by students of the chronicity of asthma affects their adherence to a physician prescribed asthma action plan, thereby making it difficult for the HCPs to create an effective asthma treatment plan and to get buy-in from the student. Student denial about the chronicity of asthma may perpetuate poor asthma control. So, when they are brought down by an asthma flare-up, they brush it off as they would the common

cold, and in the midst of an asthma flare-up they come up for air and hope to catch their breath. Reece et al. (2002) discussed how to approach asthma management plans for college students and recommended the following, “symptom monitoring, environmental control, contingency plans for rescue actions, and written instructions for medications” (p. 41). Furthermore, the time constraints of the HCPs during the brief encounter with an asthmatic student hinders the adequate delivery of asthma education needed to inform the student how he or she can best self-manage asthma. In addition, the HCP must take the time to dispel the myth that the student has outgrown his or her asthma. The student with asthma must take responsibility of managing his or her asthma, which includes fully participating in the HCPs’ treatment plan and recommendations for a follow up visit. Furthermore, the literature reveals that during their college years, students must learn how to manage their chronic illness, including scheduling and attending doctor’s appointments, filling prescriptions, taking medications, and managing flare-ups all while balancing the demands of college life (Lemly et al., 2014).

The goals of the SHC on the campus are to provide high-quality, accessible and inclusive health care services to meet the needs of students and to promote a healthy campus, lifelong health, and student well-being. I agree with these goals of the SHC in promoting student well-being, and I agree the promotion of patient self-management to reduce the impact of asthma on campus is being done by the HCPs at the SHC.

Furthermore, I have discovered through my research that three of the five student participants are transitioning to an adult role and remain dependent on their parents for advice on managing their health care needs, including asthma care and treatment. In an article by Rosen et al. (2003), the investigators discovered many young adults with

chronic conditions are at higher risk than peers for, “unnecessary dependency, developmental difficulties, and psychosocial delay” (p. 310). Furthermore, the investigators in this article commented that a successful transition to adult health care may, “help prevent these issues by enhancing autonomy, increasing a sense of personal responsibility, and facilitating self-reliance” (Rosen et al., 2003, p. 310). For example, one student participant stated her mother found a physician in the local community for her when she first moved to the city where the university is located, which may have reinforced the student’s dependency on her mother for health care decision-making. The research literature reveals during their college years, students must learn how to manage their chronic illness, including scheduling and attending doctor’s appointments, filling prescriptions, taking medications, and managing flare-ups all while balancing the demands of college life (Lemly et al., 2014). Furthermore, the transition of young adults to adult-oriented health systems, which includes student health centers on college campuses, presents a challenge for students. To aid young adults in their transition, it is recommended that an up-to-date, detailed, written transition plan be developed in collaboration with young people and their families (Rosen et al., 2003). As students transition from home to college and continue throughout their college years, they begin to assume primary responsibility for self-management of their health as well as responding to the stressors of college life and finding their way to an appropriate adult health care system. Moreover, environmental, logistical, and social factors will challenge these students as they begin to assume self-management of their chronic illness (Ravert, 2017).

Regarding the need to identify which students on campus have asthma, the literature reveals that most institutions of higher education do not have an established

electronic system or other systematic method of identifying students with a chronic illness (Lemly et al. 2014; Unwin et al. 2013). In a study of 200 institutions by Lemly et al. (2014), the authors found that the majority of colleges did not have a system to identify incoming students with chronic illness nor did the majority of schools provide an initial appointment or check-in. The findings of this dissertation study discovered that the university did not have an established systematic method of identifying students on campus with an asthma diagnosis. The university research site is a very large public institution of higher education, and currently the only way a student could be identified as having an asthma diagnosis, per the HCPs interviewed for this study, is when he or she shows up to the SHC to receive asthma care. Reece et al. (2002) offered the following suggestion to aid in identifying students with asthma on campus, “Detailed health surveys completed upon admission may identify students who have asthma, including those unaware of their condition” (p. 41). At the time of this study the university where the research was conducted did have an electronic database of students who had visited the SHC for asthma care and treatment. However, based on the prevalence of asthma among college students in the U.S, there will be a subset of students with asthma on campus that are unaware of the existence of the student health center or they are unaware they have an asthma diagnosis leaving them vulnerable to a life-threatening asthma flare-up. Therefore, as the literature reveals the transition of young adults with asthma to college goes largely unaddressed, placing them at risk for poor academic performance, increased risk taking, depression, and decreased quality of life (Levy, 2015). This research indicates that most students with a chronic illness may fall through the cracks of their newfound adult-oriented health system (the student health center) on a college campus. When a

student with a chronic illness arrives on campus, particularly at a large public university, he/she can become lost in a void unaware of access to healthcare services at the student health center. One of the student participants, Jamie, mentioned she was unaware the SHC existed until another student informed her of the SHC and the health services available on campus. Correspondingly, Reece et al. (2002) found that even though students in their study were aware of and had access to the student health center, many did not use it. The literature reveals asthma related healthcare on the college campus may be improved by the development of a systematic way to identify students with a chronic illness and establishing better marketing methods for student awareness of the SHC on campus and the available health services (Collins et al. 2015; Lemly et al. 2014; Reece et al. 2003). If SHCs are not proactive in identifying which students are living with asthma, there may arise a subset of asthmatic students who may miss out on the asthma resources available at the SHC and subsequently experience suboptimal asthma management and subsequently worsening asthma symptoms.

Implications for Theory

The experiential learning theory proposes personal learning and development is a process based on experience (Kolb, 2015). Learning is the process whereby knowledge is created through transformation of experience; knowledge results when the individual takes in information (grasping experience) and interprets and acts on that information (transformation experience) (Kolb, 2015). I found that asthmatic students and HCPs on a college campus really do learn from experience about asthma education and management. Through my analysis and interpretation of the data I found that asthmatic students were learning to adapt to their physical and social worlds and were learning from their

experiences to cope with their asthma on the college campus. Furthermore, the HCPs explicitly stated they learned from experience in caring for asthmatic students who sought out their help for easy breathing during an encounter at the SHC. In addition, ELT does not solely consider any single domain of human functioning such as cognition or perception but considers “the whole of human functioning in that learning integrates thinking, feeling, perceiving, and behaving” (Kolb, 2015, p. 43). It is with this understanding I found it appropriate to utilize ELT as a theoretical framework in the analysis and subsequent interpretation of the participants’ data in this study.

The critical aspects of ELT, namely, the emphasis on the process of adaptation and learning, and knowledge as a transformation process being continuously created and recreated have served to inform my understanding about how the participants in this study learned to manage a chronic illness on a college campus. Student participants in this study were adapting to their physical world as they prepared to go to class each day. They were taking in information (daily high temperatures and humidity levels) and learning to dress appropriately (acting on that information) as to avoid triggering their asthma from exposure to the extreme weather conditions. HCPs were learning from experience in working with asthmatic students to create an effective asthma treatment plan. In addition, the HCPs are adapted to learning in their efforts to keep updated on changing national asthma guidelines by attending continuing medical education seminars and reading online articles to increase their knowledge base of asthma management. As I read and reread the qualitative interview data for this study, I visualized the reality of my individual participants exerting their minds in a process of thinking, feeling, perceiving, and behaving thereby creating new knowledge by learning from experience managing

asthma on a college campus. As I reflect on ELT as a theory and how it portrays a dynamic view of learning whereby the learner “integrates the modes of experiencing, reflecting, thinking, and acting in a repetitive process that is sensitive to the learning situation and what is being learned” (Kolb, 2015, p. 51), it has informed my theory of how asthmatic students and HCPs learn about asthma management on the college campus. Furthermore, Kolb’s learning cycle informs my theory of how asthmatic students create new knowledge from their lived experiences by taking in information (navigating a hilly terrain or the many stairs to climb on campus) about their asthma and acting on that information to better equip themselves to self-manage their asthma on campus. Ultimately students are striving to remain free of asthma flare-ups and live the intended life of a college student, attending academic classes and engaging their social world.

Regarding how the participants make meaning and gain knowledge from their lived experiences, Kolb (2015) describes the virtue of integrity as the master virtue that integrates meaning and relevance. If the goal for asthmatic students and HCPs is to gain integrative knowledge and achieve meaning from their lived experiences, they must resolve the dialectic conflicts between meaning and relevance (Kolb, 2015). Kolb (2015) describes the way to resolve these two dialectic conflicts is to integrate more specialized virtues, that is, wisdom and justice. Kolb states, “Wisdom dictates we do not blindly follow the implications of knowledge but that we be choicefully responsible in the use of knowledge” (p. 330). In addition, Kolb (2015) explains, “Justice demands fair and equitable treatment for all against the expedience of the special situation” (p. 330). To conclude this thought on achieving meaning, Kolb goes on to describe the concept of

“centeredness”, which is borne from the experience of transcendence, “the conscious experience of hierarchic integration where what was before our whole world is transformed into but one of a multidimensional array of worlds to experience” (Kolb, 2015, p. 333). If individuals, including the participants of this study, are to achieve meaning in their lives they must practice self-reflection to raise their levels of insight about the world in which they live and incorporate the virtues of wisdom and justice to temper the demands of their daily life situations. Indeed, “When we act from our center, the place of truth within us, action is based on the fusion of meaning and relevance and hence is totally committed” (Kolb, 2015, p. 333). It takes personal commitment to successfully deal with and accept all life’s situations, including those from the past, for individuals to fully accept responsibility for the course of one’s own life, a hallmark of integrity (Kolb, 2015).

This study added to the body of knowledge by contributing the perspectives of both asthmatic college students and healthcare providers on campus thereby filling a gap in the literature. During my review of the literature I did not find any research studies that assessed the perceptions of both students and healthcare providers regarding asthma education and management on a college campus. Therefore, this study of the phenomenon of asthma education and management on a college campus will increase the empirical evidence to be reported in the literature. In addition, evidence of this study aids in the understanding of experiential learning theory (ELT) and the explanation it provides in how asthmatic students learn to manage and cope with their asthma on campus, and how healthcare providers learn from experience to better care for students with asthma. For example, ELT states that learning integrates thinking, feeling, perceiving, and

behaving; this study revealed that students learned to cope with asthma through learned behaviors and adapting to the physical world on campus. Similarly, healthcare providers learned through experience and the process of adaptation to create individualized asthma treatment plans for the students.

Implications for Education Practice

The SHC serves as a resource for asthmatic students seeking affordable care and treatment on campus. However, not all students with asthma take advantage of the resources of the SHC. This subset of asthmatic students may be at risk for a life-threatening asthma flare-up or even death. Based on the findings of this study, it is imperative that the HCPs and clinical staff employed at a SHC have adequate education and training to assess, treat, and manage students with asthma based on evidence-based medicine, that is, the GINA and NAEPP guidelines.

Quality Improvement of Asthma Care on Campus

To aid in the quality improvement (QI) of asthma care of students with asthma on campus, the findings of this study provide insight into the appropriate changes in asthma management practices that should be implemented at the SHC. QI methods are increasingly being used, “to transform care that improves patient safety, reduces unwarranted variations in care and outcomes, and produces sustainable changes in the health care delivery system” (Dolins et al., 2017, p. 1). The findings of this current study have shown there are some inconsistencies among the HCPs at the SHC in asthma management and education of students with asthma. In addition, the students were lacking knowledge in the areas of delivery technique of inhaled medications, the role of

inhaled medications in treating asthma and reducing symptoms, and the pathophysiology of asthma.

A newly designed QI program could be implemented to aid in the improvement of asthma care and student/patient outcomes at the SHC. A QI project for asthma, which could serve as a model for the SHC, is one established by the New York State Department of Health (Silver et al., 2011). With this project, the investigators utilized an audit of randomly selected medical charts of patients with asthma at fifteen primary care provider clinic sites and a feedback mechanism based on the Chronic Care Model (CCM) to assess asthma treatment and management of children and adult patients (Silver et al., 2011). The CCM “identifies essential elements of a health care system that encourage high-quality chronic disease care” (Silver et al., 2011, p. 181). These essential elements are, “the community, the health system, self-management support, delivery system design, decision support and clinical information systems” (Silver, et al., 2011, p. 181). The project utilized analyzed data from the following clinical areas: (a) information systems (e.g., clinical audits, disease registries), (b) clinical decision support (e.g., clinical processes), (c) delivery system design (e.g., integrated inter-disciplinary patient visits), and (d) patient self-management (e.g., clinician-patient formulation of asthma action plans) to implement “evidence-based change and foster productive interactions between informed patients and providers with resources and expertise” (Silver, et al., 2011, p. 181). For this study, a workgroup used the National Asthma Education Prevention Program (NAEPP) criteria to develop a quality metrics list, which was reviewed by technical expert panels. For asthma, the quality measures included:

- explicit assessment of asthma severity;

- use of long-term anti-inflammatory controller agents for patients with persistent asthma;
- office pulmonary function testing or peak flow monitoring;
- assessment of smoking history/exposure;
- assessment of trigger history;
- general asthma education;
- written asthma action plans/instructions;
- metered dose inhaler (MDI) technique assessment; and,
- peak flow monitoring at home for moderate or severe asthma. (Silver, et al., 2011, p. 182)

These quality measures would be implemented at the SHC to foster productive interactions between student/patients and HCPs to improve asthma care and student/patient outcomes. Furthermore, a personal conversation with the medical director at this study's research site revealed the need for additional education and training of the HCPs in spirometry testing (medical director, personal communication, January 14, 2019). I recommend the new asthma QI project include an assessment of the RNs' and HCPs' performance and interpretation of spirometry testing. In addition, this QI spirometry project should include a quarterly review of selected spirometry test results by a contracted pulmonologist (a physician in private practice). The pulmonologist's feedback will be provided to the medical director to direct him to ensure the quality of testing being performed by the RNs and/or HCPs meets the criteria of the American Thoracic Society standards for the performance and interpretation of lung function testing.

Access to lower cost asthma medications. An improvement that would benefit both asthmatic students and the HCPs on campus is access to free or lower cost asthma medications. Many pharmaceutical companies have drug assistance programs that offer free or low-cost medicines to individuals who do not have insurance or are underinsured and cannot afford their medicine. AstraZeneca (www.astrazeneca-us.com) is one such pharmaceutical company that offers a drug assistance program that provides inhaled corticosteroids (Pulmicort and Symbicort) for free or at a reduced cost. According to the AstraZeneca website there is no cost to sign up for the program (AstraZeneca, 2019, People Without Insurance section, para. 1). Once a student is enrolled, “he or she may remain enrolled for up to one year” (AstraZeneca, 2019, People Without Insurance section, para. 1). Furthermore, “at the end of that year the student may reapply” (AstraZeneca, 2019, People Without Insurance section, para. 1). Through a drug assistance program such as AstraZeneca, students may qualify for free medicines if they do not have health insurance, do not have enough health insurance to cover their medicines or meet certain criteria. A drug assistance program allowing access to free or lower cost asthma medications, specifically corticosteroids, would benefit both HCPs and asthmatic students. Furthermore, the students would benefit from lower cost or free asthma medications by being able to have access to the physician-prescribed asthma medications they need to keep their asthma in control thereby improving their quality of life.

However, the literature on improving the affordability of prescription medications for people with asthma reveals it is not an easy task (Patel et al., 2018). The road to implementing lower cost asthma medications is fraught with many complex

issues that involve numerous government and private entities that regulate, develop, distribute, dispense, and purchase prescription medications (Patel, et al., 2018). The primary factor stifling the availability of lower cost prescription medications in the U.S. is rising healthcare costs (Patel et al., 2018). The rising medication costs are passed on to patients which results in higher out-of-pocket expenses for patients placing an undue financial burden on individuals with asthma and other chronic respiratory diseases. This scenario can “increase stress and fear, and cost-related nonadherence worsens health status and leads to unnecessary hospitalizations” (Patel et al., 2018, p. 1368). Ironically the corticosteroid prescription medications that are the mainstay of controlling airways inflammation, the underlying problem with asthma, are the most expensive medications an asthmatic student may have to purchase, and most likely he or she will pay out-of-pocket if the student does not have medical insurance coverage. Even with medical insurance coverage, the out-of-pocket cost can be high for a college student because there are a limited number of generic corticosteroid medications, due to a lack of competition, available in the U.S. (Patel, et al., 2018). With the lack of a less expensive generic corticosteroid medication the student is forced to pay out-of-pocket for a more costly brand name medication. There exists a critical situation since more than half (58%) of the total spending to treat asthma for an individual is paid out for prescription medications (Patel et al., 2018). Patel et al. (2018) state a change in policy at the national level is needed to improve the affordability of prescription medications in the United States. I realize this is an enormous task, but it is certainly worth investigating on behalf of the asthmatic students on college campuses and the HCPs at the SHCs that are prescribing the medications.

Improving the physician/student encounter. Based on the findings of this study, the process of the optimal delivery of asthma education and management to students begins with establishing a trusting relationship between the student and HCP at the SHC. However, what surfaced from the findings of my study was a conundrum regarding this relationship. The asthmatic students expressed they want an educative and meaningful relationship with the HCPs; however, the HCPs' perception of this situation is that most asthmatic students have no urgency in establishing a relationship for asthma care with an HCP. This is because the HCPs perceive students do not believe asthma is a chronic condition. HCPs perceive most students view their asthma as a sporadic issue they deal with a few times a year. But, I found that the asthmatic students in this study were interested in establishing a meaningful relationship, one in which they would learn about their asthma from the HCP. The perceptions of the students and HCPs are pointing to the same problem, that is, not establishing a trusting, educative partner-relationship. However, the HCPs and students are far apart in their perspectives of this situation. While the HCPs' perception that students do not think their asthma is chronic might be true for some students with asthma, I found it was not true for my student participants. Furthermore, the student data are in direct opposition to the perspective that students do not want to establish relationships with HCPs. These students want to manage their asthma, and they want educational/meaningful relationships with their HCPs, but their experiences with those at the SHC have not always provided them with much confidence in those relationships.

I have reflected over what this inconsistency in perception means for my study, and I have concluded that this situation has developed over time and will continue unless

changes are made to the approach of asthma education and management on campus, including student/HCP encounters. It is my belief that the following quotes found in the participant data point to the basis for the inconsistency in perception. The student participant, Kat states, “I don’t know what I don’t know”, and the healthcare provider, Bill states, “They don’t what they don’t know”. So, I think the starting point would be for the students and HCPs to begin asking the right questions regarding asthma education and management in the content of the student/HCP encounter. However, to ask the right questions dictates the individuals have enough knowledge about the subject to know which questions to ask to obtain the information needed to begin to resolve this issue. This inconsistency in perception may be diminished or possibly eliminated by student and HCP acquisition of additional knowledge and training in asthma education and management and the implementation of a new approach to the student/HCP encounter. The need for additional knowledge acquisition and training of asthmatic students and HCPs was addressed in chapter IV of this dissertation.

To supplement knowledge acquisition and training of the students and HCPs, optimal delivery of asthma education and management can be enhanced by the establishment of a trusting relationship between the student and HCP at the SHC. One approach found in the literature that can facilitate this relationship is the interactive, two-way process referred to as shared decision-making. Shared decision-making (SDM) involves the student and the HCP working together to co-plan for the future health of the student. With a SDM approach the patient is encouraged to play a more active role as compared to previous encounters with an HCP (Tapp et al., 2014). The patient information gathered during an interview with the HCP along with the medical history,

current symptoms, and diagnostic test results informs the HCP about an individual's asthma. But with a SDM approach, the patient is asked to tell the HCP how his or her asthma is affecting his or her life and what the patient hopes to get out of the treatment (Tapp, et al., 2014). Furthermore, the HCP will teach the patient basic things about asthma and the different alternatives for treatment. Then the HCP and asthmatic student work together to help choose a plan that will work best for the patient. To put it simply, in a SDM approach to asthma care the HCP and patient act as equal partners (Tapp et al., 2014).

I advocate that the SDM process begin before the asthmatic student arrives on campus by creating a bridging experience. This process would bridge the asthma care between the hometown experience and the college experience. For example, a transition plan would be created by the student's current physician practice (e.g., pediatrician, allergist) prior to arrival on the college/university campus. In addition to the transition plan, a clinician checklist (from the current physician practice) for the transitioning college student would be created and the receiving practice (SHC) would provide an orientation to the adult healthcare model for the student (Unwin et al., 2013). This transition plan could be made known to students and their parents via the SHC website and during a session at the new student and transfer student orientation sessions. An initial meeting with the current physician would serve to assess the student and family readiness for transfer to a new adult physician, encourage assumption of increased responsibility for the student's asthma management, ensure that the student understands his/her asthma and medications, assess the student's ability to make independent decisions regarding health care, and provide anticipatory guidance on health insurance

and asthma (Unwin et al., 2013). Furthermore, during orientation at the SHC the student will meet with an HCP to begin the SDM process by first working together to co-plan for an asthma treatment plan for the student while enrolled in college. Student/Patient information gathered during the initial interview with the HCP at the SHC along with the medical history, current symptoms, and diagnostic test results will inform the HCP about the student's current level of asthma control. Lastly, the student/patient will be asked to explain to the HCP how his or her asthma is affecting his or her life and what the student/patient hopes to get out of his/her asthma treatment plan (Tapp, et al., 2014).

I believe the HCPs in this study are doing their best to involve the students in creating an effective asthma treatment plan. However, the addition of a formally adopted SDM approach could improve the consistency and the care of students with asthma. With a SDM approach, the student can tell his or her asthma journey in an open manner to the HCP. This method of communication will provide both the student and HCP a better understanding of the student's asthma symptoms thereby aiding in the development of an appropriate treatment plan and better student compliance with that plan. Establishing a SDM approach at the SHC is imperative since research reveals that despite advances in medical knowledge poor outcomes and disparities for patients with asthma persist (Tapp et al., 2014). Tapp et al. (2014) investigated six primary care clinics to evaluate the implementation of an SDM approach. The methods used to evaluate the SDM approach included, (a) asthma exacerbations, (b) level of patient involvement in the decision-making process, and (c) qualitative assessments from patients and providers. Unfortunately, in the Tapp et al. (2014) study the implementation of the SDM approach was met with barriers to include limited support staff, lack of clinic resources, and

pressure on primary care clinics to improve efficiency. To facilitate the implementation of an SDM approach at the SHC, I recommend utilizing the Asthma SDM toolkit, which was also used in the Tapp et al. (2014) study. The free, downloadable SDM Toolkit includes (a) an instrument to assess baseline asthma control, (b) a guide for eliciting the patient's goals and priorities around medication options, (c) asthma educational materials, and (d) a tool to guide the negotiation process to jointly develop a treatment regimen that accommodates the patient's goals and preferences. In addition, an asthma action plan is provided along with implementation resources and a training video (Tapp, et al., 2014).

I have discovered from my study the HCPs at the SHC are pressed for time to interview, assess, diagnosis, educate, prescribe medications, and write an asthma action plan for the asthmatic student all in an encounter that lasts 30 minutes or less. With that said, an SDM approach will take a team effort from the SHC administration down to the clinic staff to implement at the SHC. However, it is my belief that implementing a SDM approach would dovetail nicely with the goals of the SHC to improve the health and well-being of students with asthma, and to encourage students' active responsibility in partnering with their HCPs for improved, life-long maintenance of their disease.

Furthermore, the need for more consistency regarding communication between students and HCPs via the online patient portal is another area coming forth from the findings of this study. The data revealed students preferred the convenience of the on demand feature of the online patient portal and having access to their new health information from each student/HCP encounter at the HCP. This study revealed inconsistency in the use of the online patient portal by the HCPs in communicating a student's new health information such as:

- laboratory test results,
- vital signs,
- spirometry results,
- peak flow measurements,
- written, personalized asthma action plan,
- written asthma literature given to the student,
- prescription for asthma medications,
- referral to an asthma specialist, and
- written follow-up appointment schedule for the SHC.

The HCPs were using the online patient portal, but not to the satisfaction of the asthmatic students. To facilitate communication between the HCP and student, a procedure should be created in collaboration with the medical director to ensure all the students' pertinent asthma-related new health information is consistently uploaded to the online patient portal following an encounter with the asthmatic student. In addition, students would be given written instructions on how to access and use the online patient portal to enhance communication with the HCPs at the SHC.

And lastly, another important document used to communicate pertinent information to the student about his/her asthma, particularly how to respond to worsening asthma symptoms, is the asthma action plan. As discussed in chapter IV, the 2018 GINA report recommends everyone with asthma receive a personal asthma action plan (AAP). A personal AAP show the student/patient how to make short-term changes to treatment in response to changes to his/her symptoms and/or peak expiratory flow, as well as, how and when to access medical care (GINA, 2018). Unfortunately, the data for this study

shows some of the HCPs did not always develop an AAP for the asthmatic student as recommended by the GINA report. It is my assessment that the lack of preparing an individualized AAP by the HCPs for the asthmatic student results in missed opportunities to encourage students to self-manage their asthma, learn about asthma medications and when it is appropriate to use them, and when to contact the physician for urgent care or hospitalization. The implementation of consistency in distributing an individualized asthma action plan form among the HCPs for each asthmatic student, who meets predetermined criteria (i.e., severity of asthma or peak flow measurement) may possibly improve asthma management and increase student/patient satisfaction with asthma care at the SHC. In collaboration with the medical director, the HCPs need to establish the criteria for which students are provided with an individualized asthma action plan based on evidence-based national asthma guidelines.

Implications for Policy

The policies of the SHC could be augmented by the implementation of creative outreach methods to new or transfer students on campus to identify which students on campus have an asthma diagnosis. One creative outreach method would be the implementation of an asthma checkup day at the SHC at the beginning of the fall semester each year. This event could be staffed with some of the providers and staff from the SHC along with respiratory care faculty. The purpose of the event would be to aid in the education of students about their asthma in a relaxed atmosphere when they are not experiencing asthma symptoms. In addition, the event could aid in identifying students who have an asthma diagnosis and establish a medical record of their asthma history and current prescription medications. Furthermore, the event will function to obtain a baseline

spirometry test to document the student's lung function when he or she is not experiencing asthma symptoms. The SHC staff and HCPs could begin to establish a relationship with students with asthma as they consult with them during this informal event. In addition, the asthma checkup day would serve to distribute marketing information about the asthma services available to students through the SHC on campus and offer free written asthma education literature.

A second potential policy at the university level could be implemented through the residential assistants (RAs) of the residence halls on campus. The residential community of students living on campus could benefit from training provided to residence hall directors and RAs in the dormitories by a certified asthma educator to increase their knowledge about how to recognize a student who is experiencing a life-threatening asthma flare-up. The RAs would learn about the asthma resources on campus and where to go to find help for someone who is experiencing an asthma flare-up and needs immediate attention. The education about asthma to the residents on campus could be provided in the form of periodic presentations by RAs who have been trained as peer-to-peer asthma educators through an asthma educator curriculum available through the Association of Asthma Educators.

A third recommendation addresses the HCPs employed at the SHC; their job requires up to date information regarding all aspects of delivery of medical care to the students to meet the goals and mission of the SHC. A recommendation for policy is the engagement of an appropriate national professional organization that would benefit from this study's findings. One such professional organization is the Accreditation Association for Ambulatory Health Care (AAAHC), the accrediting body of student health centers on

college campuses in the U.S. Furthermore, the SHC where this study was conducted is currently accredited by the AAAHC. Future policy at the AAAHC organization regarding the delivery of asthma care by healthcare providers on college campuses may be influenced by the findings of this study such as the implementation of a quality improvement (QI) plan to include the following: (a) biennial refresher course (two-day workshop) in spirometry offered by the National Institute of Occupational Safety and Health (NIOSH) on how to perform spirometry for healthcare providers employed at student health centers on college campuses, (b) annual review of selected patient spirometry reports by a licensed physician to confirm adherence to performance standards outlined in the ATS guidelines, and (3) annual course conducted by a certified asthma educator to update the healthcare providers on the changes and recommendations of the GINA asthma guidelines.

And lastly, a fourth recommendation is to establish communication between the sending practice (current physician of the student) and the receiving practice (HCPs at the SHC) prior to the transition of the asthmatic student to an adult care model at the SHC. To improve the quality of care and the student/patient experience, a policy would be implemented that outlines a procedure for transitioning an asthmatic student for adult care at the SHC to include:

- orientation to the adult healthcare model for the student by the SHC staff;
- a selected HCP to meet privately with the student to collaborate on an asthma treatment plan;
- education to ensure the student understands his/her asthma and the role of asthma medications in reducing symptoms;

- provide anticipatory guidance on health insurance and accessing medications and medication delivery devices from the pharmacy; and,
- assess the student's ability to make independent decisions regarding health care. (Unwin et al., 2013, p. 600)

In addition, the transition of the student would include the student's pertinent documents (i.e., medical records, diagnostic test results, current asthma medications) to be transferred from the sending practice to the SHC. An HCP at the SHC would be identified to assist the asthmatic student in his or her transition through use of shared decision-making whereby the student and the HCP work together to co-plan for the future health of the student.

Ethical Issues of Conducting this Study

A commitment to protect the rights and dignity of subjects must be built-in to the design and conduct of any research project (Portney & Watkins, 2009). As such I have completed research ethics and compliance training through the Collaborative Institutional Training Initiative (CITI) program prior to IRB approval and the start of data collection for this study. The integrity of the researcher is paramount as it relates to the honesty and integrity in all phases of research process, including pursuing relevant research questions and performing research that is meaningful (Portney & Watkins, 2009). Regarding this dissertation, I brought an attitude of ethical research practice as I collected and analyzed the data. And, the research questions for this study were appropriate for obtaining meaningful data on the status of asthma education and management on the college campus. Furthermore, utilizing the three fundamental ethical principles of respect for persons, justice, and beneficence, I strove in this study to maximize the potential benefits

while minimizing any potential harm (Chatburn & Craig, 1988).

One ethical issue I faced during data collection was the asthmatic students' lack of knowledge about the proper use, adverse effects, and indications for use of their current asthma medications, which can directly control of asthma symptoms. Improper use of asthma medication and the delivery devices can lead to poor asthma control and worsening symptoms. To provide ethical care, I spent time after the interviews with the students to clarify the proper use, adverse effects, and indications of the use of their current asthma medications. For example, as previously mentioned, one student had been prescribed two asthma rescue inhalers which contained the same medication (Albuterol). After the interview she showed me her two asthma inhalers she had received from the SHC on campus, and I explained they were the same medication. She was under the impression the inhalers contained two different medications, one being a rescue medication inhaler (use only as needed) and the other a controller medication (use daily as directed) inhaler for her asthma. To provide ethical care I instructed the student to return the inhalers back to the SHC and resolve the issue with an HCP. I learned a few weeks later from one of the HCP (during her interview with me) at the SHC the student indeed had gone back and the issue with the two asthma inhaler medications was resolved.

Furthermore, to adhere to good ethical practice, upon conclusion of the focus group interview, I taught the students the proper technique and breathing pattern when delivering a dose of asthma medication via an MDI with a holding chamber device. The student participants offered appreciation about the education and training they received from me regarding the use of the MDI with a holding chamber device. After the focus

group interview the three students admitted the holding chamber device was foreign to them, and they had never been introduced to the concept of using the device with their MDI medications, hence they were unaware of its importance in administering an optimal dose of asthma medication into the lungs. In addition, each student was given a free holding chamber device to keep and to use for the delivery of her asthma medications. I reinforced to the students the importance of adhering to a daily asthma medication regimen as prescribed by their doctor to ensure good control of their asthma, which is evidenced by good quality breathing and no limitations to daily activities. To follow up on these ethical issues, I plan to consult with the SHC medical director to create a plan to train the SHC clinical staff (RNs and HCPs) in the proper use of drug delivery to the lungs via an MDI with a holding chamber.

Limitations and Delimitations

Bloomberg and Volpe (2012), provide the following definition, “Limitations are external conditions that restrict or constrain the study’s scope or may affect its outcome” (Bloomberg & Volpe, 2012, p. 103). Furthermore, delimitations are, “conditions the researcher deliberately imposes to limit the scope of the study”, such was the case with my study in that it was conducted at one college campus and required student participants to have a doctor diagnosis of asthma (Bloomberg & Volpe, 2012, p. 103).

All student participants recruited and volunteering for this study were female thereby eliminating any male students’ narratives of their lived experiences with asthma on the college campus. Only one male student responded to the email request sent directly from the SHC to participate in this study; however, he did not respond to two subsequent email requests from me inviting him to volunteer for the study. Therefore, the

all-female student participants created a potential limitation to the scope of the study by the lack of males' experiences.

Delimitations of the study include that it was conducted at only one campus of a large, public university campus located in the southwest region of the United States consisting of a hilly terrain, extreme weathers conditions of high heat and humidity levels, and many airborne allergens. The student sample was comprised of only full-time undergraduates and graduate students attending the university at the research site. In addition, the healthcare provider sample was comprised of five out of a total of ten healthcare providers employed at the student health center at the time of this study. The “asthmatic participants” were students with a numerical score of less than 20 on the ACT. There may be other students on campus with asthma that do not meet the criteria-based ACT numerical score of less than 20. These other students with asthma not participating in the study may experience, manage, and learn about their asthma in similar or different ways from those with more severe scores on the ACT.

Future Research Recommendations

Future research is warranted for additional case studies of asthma on college campuses in different geographical regions of the Unites States. Case study research of asthma education and management should be conducted on college campuses in different meteorological climates with colder temperatures, lower humidity levels, and different types of airborne allergens. And, since asthma is a worldwide health problem, it may be warranted to conduct additional case studies on the college campuses of other countries that have student health centers available on their campuses. In addition, this case study consisted of all female participants; future research should include investigations of study

samples that include male participants.

Final Thoughts

Asthma is a chronic respiratory disease for which there is no cure. Effective care is dependent on good self-management and optimal use of asthma medications. Students with asthma are challenged to cope with and learn how to effectively manage their asthma in concert with all the demands and stresses associated with college life. Healthcare professionals employed at student health centers on college campuses are good resources for providing asthma care services. However, the current system of delivering patient care at the SHC to students with asthma limits the time the healthcare providers have to assess, diagnose, treat, prescribe medications, and educate a student about his or her asthma. A team effort utilizing a shared-decision making approach to asthma education and management is needed to fulfill the major goals of the SHC: (a) provide leadership in addressing the major health issues affecting student success, and (b) to provide high-quality, accessible and inclusive health care services to meet the needs of students.

APPENDIX SECTION

A. Email Recruitment Message to Students With Asthma

Subject Line. Research Participation Invitation: Asthma on the College Campus

Email Message Body.

Dear Student,

This email message is an approved request for participation in research that has been approved or declared exempt by the Institutional Review Board (IRB).

You are invited to participate in a research study. I am recruiting current students with a diagnosis of asthma to participate in this research study to be conducted on the university campus.

The purpose of this research study is to learn about how students cope with and manage their asthma on campus. The potential benefits of participating in this study include developing increased knowledge of how to better self-manage your asthma and contributing to the research of asthma on the university campus, which may benefit other students with asthma and the physicians at the student health center.

To be eligible to participate in this study you must be enrolled as a full-time or part-time undergraduate or graduate student and have been attending the university for at least two long semesters, have a diagnosis of persistent asthma, and be between 18 - 60 years of age. Participation in this research study is voluntary, and all information collected will be kept confidential.

Participation includes completion of a five-question survey about your asthma and an asthma history form, and two interviews about your experiences of living with asthma on the university campus. The anticipated time required for participation is approximately 3 hours over two separate visits in April 2018. You will receive a payment of up to \$40 for your participation.

This project 2018504 was approved by the IRB on March 27, 2018. Pertinent questions or concerns about the research, research participants' rights, and/or research-related injuries to participants should be directed to the IRB chair or to the IRB administrator.

Thank you for your consideration.

Sincerely,
Kevin Collins

B. Asthma Control Test

Know your score. The Asthma Control Test™ provides a numerical score to help you and your healthcare provider determine if your asthma symptoms are well controlled.

Take this test if you are 12 years or older. Share the score with your healthcare provider. Step 1: Write the number of each answer in the score box provided. Step 2: Add up each score box for the total. Step 3: Take the completed test to your healthcare provider to talk about your score. **IF YOUR SCORE IS 19 OR LESS**, your asthma symptoms may not be as well controlled as they could be. No matter what the score, bring this test to your healthcare provider to talk about the results. **NOTE:** If your score is 15 or less, your asthma may be very poorly controlled. Please contact your healthcare provider right away. There may be more you and your healthcare provider could do to help control your asthma symptoms.

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?

All of Time [1] Most of of the time [2] Some of the time [3] A little of the time [4] None of the time [5] Score ____

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

More than Once day [1] Once a day [2] 3 to 6 times a day [3] Once or twice a week [4] Not at all [5] Score ____

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

4 or more per week [1] 2 to 3 nights a week [2] Once a week [3] Once or twice [4] Not at all [5] Score ____

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

3 or more Times/day [1] 1-2 times/day [2] 2 or 3 times/week [3] Once a week or less [4] Not at all [5] Score ____

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

Not Controlled [1] Poorly Controlled [2] Somewhat Controlled [3] Well Controlled [4] Completely Controlled [5] Score ____

Name: _____

ASTHMA CONTROL TEST™ Total Score _____

C. Asthma History Form

ASTHMA HISTORY

Name: _____ DOB: _____ Date: _____

1. When were you first diagnosed with asthma? Month/Year: _____
2. Last asthma episode? How many asthma episodes in the last 12 months? _____
Any ER visits? Yes / No Hospitalized? Yes / No Ever had a breathing tube put in for asthma? Yes / No
Last ER Visit for Asthma: _____ Last Hospitalization for Asthma: _____
Year/Date of Breathing Tube for asthma _____ Where? _____
3. Put an **X** next to the **best description** of your asthma symptoms **before treatment was first begun**:

 Continual symptoms; limited physical activity; frequent asthma attacks; frequent nighttime symptoms
 Daily symptoms & use of “rescue inhaler”, asthma affects activity/**occurs 2 or more times/week**; may last days; nighttime symptoms over 5 X month
 Symptoms **more than 2 X week, but less than 1 X day**; asthma may affect activities; nighttime symptoms 3-4 X month
 Symptoms **less than 2 X week**; no symptoms & normal peak flow between attacks; nighttime <2 X month
4. List Medications used for asthma below: How often do you use each?
5. Does the medication control your asthma? Yes / No / Sometimes
6. What worsens your asthma? Exercise / Pollens / Smoke / Colds / Animals / Weather Conditions (cold/hot/humid)
7. Do you smoke? Yes / No; If yes, cigarettes / cigars/ day. Use other tobacco products (e-cigs, vaping, hookah)?
8. Are you constantly around someone who smokes? Yes / No
9. Does asthma limit any activity? Yes / No If so, how often?
10. Do you use a Peak flow meter? Yes / No Spacer? Yes / No
If so, brand (s) last used? _____
Have you ever established a personal best Peak Flow: Yes / No; When? _____
If so, what is your personal best Peak Flow number: _____
11. How many times in the last 12 months were you given steroids, injections or pills?
12. Have you ever seen an asthma specialist (e.g., pulmonary doctor or allergist)? Yes / No
When? _____ Where? _____
13. When was the date of your last asthma checkup?
14. Have you ever received specific education on asthma? Yes / No When?
15. Who currently treats your asthma? Please provide the following:
Name _____
Address _____
Phone _____

D. Consent Form

INFORMED CONSENT (Student Participant)

Study Title: Living with and Learning about Asthma on the College Campus

Principal Investigator: Kevin Collins, M.S., RRT, RPFT, AE-C

This consent form will give you the information you will need to understand why this research study is being done and why you are being invited to participate. It will also describe what you will need to do to participate as well as any known risks, inconveniences or discomforts that you may have while participating. We encourage you to ask questions at any time. If you decide to participate, you will be asked to sign this form and it will be a record of your agreement to participate. You will be given a copy of this form to keep.

PURPOSE AND BACKGROUND

You are invited to participate in a research study to find out how college students with asthma learn about and cope with their asthma on the college campus. This information may help physicians and other healthcare providers at the student health center on campus improve the care and treatment of college students with asthma. You are being asked to participate because you have asthma. In order to decide whether or not you should agree to be a part of this study, you need to understand enough about the study to make an informed judgment. This process is known as informed consent. Please take your time to decide and feel free to ask questions.

PROCEDURES

1. If you agree to be in this study, you will participate in the following:

- **First Procedure:** You will need to complete two written forms related to your asthma to aid the researcher in determining if you meet study eligibility. The two forms are: 1) asthma history and, 2) asthma control test.
- **Second Procedure:** One interview, face-to-face with the researcher, where you will describe your experiences regarding living with asthma on the college campus.
- **Third Procedure:** One focus group interview, following completion of all the individual interviews, facilitated by the researcher and one assistant and will include a group of 5 students, including yourself, with asthma in which you will describe your experiences of living with asthma on the university campus.

2. Information about the completion of the asthma history and asthma control test forms.

You will need to complete the asthma history and the asthma control test forms. The researcher will email both forms to you so that you may answer the questions and complete the forms in writing. Information collected on these forms are related to your asthma, including history, diagnosis, asthma medications and an assessment of how well your asthma is currently controlled based on your numerical score on the asthma control test. The information will be kept confidential and will be used by the researcher to determine your eligibility for this study. You will fill in these forms with a pen and then scan them and email them to the researcher. The asthma history form was created by the student health center. The asthma control test is a five-question survey used by physicians and other healthcare professionals to determine an individual's level of asthma control based on a numerical score. To be included in this study, the researcher is looking for students with poorly controlled asthma as indicated by a numerical score of less than 20 on the asthma control test.

3. Information about the face-to-face, individual interview.

If you agree to be in the study, you will be asked to participate in one face-to-face interview with the researcher lasting approximately 60-minutes. The interview will be conducted during April 2018 at the university library on campus. During the individual interview, I am interested in asking questions about your experiences of living with and coping with asthma on campus. In doing so, I have some questions for you that will require you to think about instances throughout your life regarding living with and coping with asthma, as well as recently as a student with asthma on campus. The interview will be audio-recorded to make sure that it is recorded accurately, and I will also take notes. To protect the confidentiality of all participants, all transcripts will be coded with pseudonyms. The researcher will contact you to arrange a date and time to meet for the interview at the library. The researcher will email you the interview questions you will be asked at least 3 days prior to the interview meeting.

4. Information about the focus group interview.

If you agree to be in the study, you will be asked to participate in the focus group interview with the researcher lasting approximately 1 ½ hours. I will invite 5 students with asthma to meet in a room at the library to participate in the focus group interview. The time frame for conducting the focus group interview will be during April 2018 and we will meet at the library on the university campus. During the focus group interview, I am interested in asking questions about the experiences of the group regarding learning about, living with, and self-managing asthma on a university campus. In doing so, I have some questions for the group that will require everyone to think about instances throughout their life regarding living with asthma, as well as recently as a student with asthma on campus. The focus group interview will be videotaped and audio-recorded to make sure that it is recorded accurately, and an assistant will also take notes. To protect the privacy of the group in the focus group, all transcripts will be coded with pseudonyms and we ask that you not discuss what

is discussed in the focus group with anyone else. The researcher will contact you to arrange a date and time to meet for the focus group interview at the university library. The researcher will email you the focus group interview questions you will be asked at least 3 days prior to the interview meeting.

RISKS/DISCOMFORTS

This study is anticipated to present minimal risks of harm to you. Minimal risks are those risks which are not greater than those you might ordinarily encounter in daily life or during the performance of a routine assessment of your asthma during a doctor's office visit. The individual interview will include questions regarding your demographic information (e.g., age, major, college classification). The researcher will make every effort to protect the participants' confidentiality. And, if you are uncomfortable answering any question on a written form or during the interviews, you may choose not to answer the interview question or leave blank any answer on the written forms. In the event that some of the individual interview or focus group questions make you uncomfortable or upset, you are always free to decline to answer or to stop your participation at any time. Should you feel discomfort after participating and you are a student, you may contact the Student Health Center for counseling services. The Student Health Center is located on the university campus.

BENEFITS

Your participation in the program may benefit you and healthcare providers doing work in college health in the following manner: 1) you may develop increased awareness of asthma services provided by the student health center on campus, 2) you may develop increased knowledge of asthma self-management and, 3) your responses during the interviews may inform the healthcare providers at the student health center, the researcher, and the readers of the published dissertation findings of improved ways to deliver asthma care to students on a university campus.

EXTENT OF CONFIDENTIALITY

Reasonable efforts will be made to keep the personal information in your research record private and confidential. Any identifiable information obtained in connection with this study will remain confidential and will be disclosed only with your permission or as required by law. The members of the research team and the University Office of Research Compliance (ORC) may access the data. The ORC monitors research studies to protect the rights and welfare of research participants. Data will be kept for three years (per federal regulations) after the study is completed and then destroyed.

PAYMENT/COMPENSATION: You will receive two, pre-paid \$20 Visa gift cards for a total payment of \$40 for your participation. You will be paid \$20 immediately after the face-to-face, individual interview and an additional \$20 immediately after the focus group interview.

PARTICIPATION IS VOLUNTARY

You do not have to be in this study if you do not want to. You may also refuse to answer any questions you do not want to answer. If you volunteer to be in this study, you may

withdraw from it at any time without consequences of any kind or loss of benefits to which you are otherwise entitled.

QUESTIONS

If you have any questions or concerns about your participation in this study, you may contact the Principal Investigator, Kevin Collins.

This project (IRB # 2018504) was approved by the IRB on March 27, 2018. Pertinent questions or concerns about the research, research participants' rights, and/or research-related injuries to participants should be directed to the IRB Regulatory Manager 512-555-2222.

DOCUMENTATION OF CONSENT

I have read this form and decided that I will participate in the project described above. Its general purposes, the particulars of involvement and possible risks have been explained to my satisfaction. I understand I can withdraw at any time.

_____	_____	_____
Printed Name of Study Participant	Signature of Study Participant	Date
_____		_____
Signature of Person Obtaining Consent		Date

E. Consent Form

INFORMED CONSENT (Healthcare Provider Participant)

Study Title: Living with and Learning about Asthma on the College Campus

Principal Investigator: Kevin Collins, M.S., RRT, RPFT, AE-C

This consent form will give you the information you will need to understand why this research study is being done and why you are being invited to participate. It will also describe what you will need to do to participate as well as any known risks, inconveniences or discomforts that you may have while participating. We encourage you to ask questions at any time. If you decide to participate, you will be asked to sign this form and it will be a record of your agreement to participate. You will be given a copy of this form to keep.

PURPOSE AND BACKGROUND

You are invited to participate in a research study to find out about the attitudes and perceptions of healthcare providers regarding the current state of the education and management of college students with asthma on the university campus. This information may help the healthcare providers at the student health center on campus improve the care and treatment of college students with asthma, as well as other healthcare providers that may read the published dissertation findings. You are being asked to participate because you are a healthcare provider at the student health center on campus. In order to decide whether or not you should agree to be a part of this study, you need to understand enough about the study to make an informed judgment. This process is known as informed consent. Please take your time to decide and feel free to ask questions.

PROCEDURES

5. If you agree to be in this study, you will participate in the following:

- **First Procedure:** One interview, face-to-face with the researcher, where you will discuss your experiences caring for and treating college students with asthma on campus.

- **Second Procedure:** One focus group interview, following completion of all the individual interviews, facilitated by the researcher and one assistant and will include a group of 5 healthcare providers from the student health center, in which the group will discuss the current state of the education and management of college students with asthma on campus.

6. Information about the face-to-face individual interview.

If you agree to be in the study, you will be asked to participate in one face-to-face interview with the researcher lasting approximately 60-minutes. The interview will be conducted during April/May 2018 at the student health center

on campus. During the individual interview, I am interested in asking questions about your experiences in caring for and treating students with asthma on campus. In doing so, I have some questions for you that will require you to think about your experiences in caring for and treating college students with asthma. The interview will be audio-recorded to make sure that it is recorded accurately, and I will also take notes. To protect the confidentiality of all participants, all transcripts will be coded with pseudonyms. The researcher will contact you to arrange a date and time to meet for the interview at the student health center. The researcher will email you the interview questions you will be asked at least 3 days prior to the interview meeting.

7. Information about the focus group interview.

If you agree to be in the study, you will be asked to participate in the focus group interview with the researcher lasting approximately 1 ½ hours. I will invite 5 healthcare providers to meet in the conference room at the student health center to participate in the focus group interview. The time frame for conducting the focus group interview will be during April/May 2018 and we will meet in the conference room of the student health center. During the focus group interview, I am interested in asking questions about the experiences of the group regarding learning about, living with, and self-managing asthma on a university campus. In doing so, I have some questions for the group that will require everyone to think about their experiences in caring for and treating college students with asthma at the student health center on campus. The focus group interview will be videotaped and audio-recorded to make sure that it is recorded accurately, and an assistant will also take notes. To protect the privacy of the group in the focus group, all transcripts will be coded with pseudonyms and we ask that you not discuss what is discussed in the focus group with anyone else. The researcher will contact you to arrange a date and time to meet for the focus group interview. The researcher will email you the focus group interview questions you will be asked at least 3 days prior to the interview meeting.

RISKS/DISCOMFORTS

This study is anticipated to present minimal risks of harm to you. Minimal risks are those risks which are not greater than those you might ordinarily encounter in daily life. The individual interview will include questions regarding your demographic information (e.g., age, credentials, length of employment). The researcher will make every effort to protect the participants' confidentiality. And, if you are uncomfortable answering any question during the interviews, you may choose not to answer the interview question. In the event that some of the individual interview or focus group questions make you uncomfortable or upset, you are always free to decline to answer or to stop your participation at any

time. Should you feel discomfort after participating you may contact the Student Health Center for counseling services.

BENEFITS

Your participation in the program may benefit you and others doing work in college health in the following manner: your responses during the interviews may inform your fellow healthcare providers at the student health center on campus, the researcher, and the readers of the published dissertation findings of improved ways to deliver asthma care to students on a university campus.

EXTENT OF CONFIDENTIALITY

Reasonable efforts will be made to keep the personal information in your research record private and confidential. Any identifiable information obtained in connection with this study will remain confidential and will be disclosed only with your permission or as required by law. The members of the research team and the University Office of Research Compliance (ORC) may access the data. The ORC monitors research studies to protect the rights and welfare of research participants. Data will be kept for three years (per federal regulations) after the study is completed and then destroyed.

PAYMENT/COMPENSATION: You will not be paid for your participation in this study.

PARTICIPATION IS VOLUNTARY

You do not have to be in this study if you do not want to. You may also refuse to answer any questions you do not want to answer. If you volunteer to be in this study, you may withdraw from it at any time without consequences of any kind or loss of benefits to which you are otherwise entitled.

QUESTIONS

If you have any questions or concerns about your participation in this study, you may contact the Principal Investigator, Kevin Collins.

This project (IRB #2018504) was approved by the IRB on March 27, 2018. Pertinent questions or concerns about the research, research participants' rights, and/or research-related injuries to participants should be directed to the IRB Chair or to the IRB Regulatory Manager.

DOCUMENTATION OF CONSENT

I have read this form and decided that I will participate in the project described above. Its general purposes, the particulars of involvement and possible risks have been explained to my satisfaction. I understand I can withdraw at any time.

_____	_____	_____
Printed Name of Study Participant	Signature of Study Participant	Date
_____		_____
Signature of Person Obtaining Consent		Date

F. Face-to-Face Semi-Structured Interview Protocol Healthcare Providers

The interviews of the healthcare providers will be conducted face-to-face utilizing an open-ended, semi structured format influenced by the study's theoretical framework. I will audio record the interviews which will be transcribed verbatim for data analysis. The following are the questions to be asked of the healthcare provider participants:

- Please state your name and briefly tell me about your responsibilities here at the SHC.
- Briefly tell me about your medical background and training.
- Briefly describe your experience working in college health.
- Explain how you learned about asthma, lung function testing, and treatment protocols for adults with asthma.
- What do you know about the GINA Guidelines or the NAEEP program guidelines for the prevention and treatment of asthma in adults?
- Please describe your understanding of the current state of asthma education and management on campus?
- Describe in your own words how a typical visit at the SHC proceeds for a student with asthma that is experiencing symptoms (e.g., wheezing, shortness of breath, cough)?
- What are some strategies you think students have to learn about and manage their asthma? What would you like them to do?
- What literature might you give to students who have asthma on campus?
- How do you perceive that students are learning to self-manage their asthma during their college years?
- In your experience, in what ways do students cope with their asthma while enrolled here?
- In your experience, what are some of the most common misconceptions that students have about their asthma?
- Describe a typical week at the SHC in interacting with students with asthma?
- What are your primary concerns when caring for and treating a student with asthma?
- Is there anything else you would like to add?

G. Face-to-Face Semi-Structured Interview Protocol: Students

Thank you for meeting with me today. As you know, I am interested in investigating the experiences of learning about, living with, and managing asthma on a university campus. In doing so, I have some questions for you that will require you to think about instances throughout your life, as well as recently as a student on campus. The questions for you are:

- Please state your name, major, and classification?
- When were you first diagnosed with asthma?
- Which time of the year is most troublesome for your asthma?
- Where do you go or who do you prefer to obtain treatment for your asthma?
- How many visits have you made to the SHC on campus for the treatment of your asthma during your time in college? How did you find these experiences?
- Do you know what triggers an asthma flare for you? Please tell me about a time when this has occurred for you while being a student here.
- What literature have you received or found about asthma on campus?
- How do you go about learning about asthma and taking care of yourself regarding your asthma?
- Explain what it is like for you to have asthma at this time in your life and on this college campus?
- In what ways do you cope with your asthma at college? Can you tell me about an example that helps me understand about these coping strategies?
- What have you learned about managing your asthma while attending college?
- Do you wish you knew more about asthma? What would you like to know more about asthma?
- What do you perceive as the greatest challenge in managing your asthma while you are on or off campus? Please explain.
- What are the greatest barriers that you have encountered during your time at college in managing your asthma?
- Where can you/do you prefer to go to find health information about the care or treatment of your asthma?
- Who do you trust to provide accurate information to you regarding the treatment of your asthma? Why?
- Do you believe that the primary healthcare provider who you see for asthma has all the resources necessary to treat your asthma? Please explain.
- Is there anything else you would like to add?

H. Student Health Center Impact Statement

IMPACT STATEMENT 2016-2017: The SHC supports the academic and personal success of all students by providing public health leadership to the campus community and accessible, inclusive health and wellness services. For the academic year 2016-2017, the following is a summary of activity at the SHC:

- 33,449 Total Patient Contacts
- 22,590 Primary Care, Women's Health, Sports Medicine visits
- 6,131 Allergy, Immunization, STI Screening, Travel Health visits
- 1,752 Psychiatry Visits
- 25,558 Lab Tests; 764 X-Rays
- 23,168 Prescriptions and OTCs
- 51,228 Call Center calls
- 1,762 RN triage phone calls
- 2,377 Flu Shots given

SERVICES PROVIDED: Primary Care • Women's Health • Travel Health • Psychiatry • Sports Medicine • Laboratory Tests • X-Rays • Pharmacy • 24 Hour Ask A Nurse Service • Health Promotion Services. Additional information:

- 17,536 Total individual students served by Clinic, Pharmacy and Health Promotion Services
- 25,000 Square feet Built in 2004 – when TXST enrollment was 26,306 compared to 38,808 today!
- 22 Exam rooms
- 1 procedure room and 1 observation room
- Lab, X-Ray and Pharmacy on site
- 30 Trained Peer Educators

I. Focus Group Interview Guide Outline

- Welcome
 - Introduce moderator
- Our topic is asthma education and management on the college campus.
 - The results of this interview will be analyzed, and a written report will be published in the researcher's dissertation manuscript
- Guidelines for Participants
 - No right or wrong answers, only differing points of view.
 - Please, one person speaks at a time.
 - You do not need to agree with others, but please listen respectfully as others share their views. (Krueger, 2002)

J. Focus Group: Semi-Structured Focus Group Protocol: Students

Focus group interview questions may be researcher-generated, or they may arise from the face-to-face interviews, which will be conducted prior to the focus group interview. The following are some potential researcher-generated focus group interview questions that may be asked of the college student participants with asthma:

- Please share your experiences of having asthma at this time in your life and on this college campus?
- Now that you are an adult, how is living with asthma different from when you were first diagnosed (for those who were diagnosed as children)?
- What have you learned about managing your asthma while attending college?
- What more do you wish you knew about asthma?
- What are your perceptions of the physicians and nurses treating you at the SHC? Do they seem knowledgeable and competent with your asthma care?
- What do you perceive as the greatest challenge in managing your asthma on campus or off campus?
- Who do you trust to provide accurate information to you regarding the treatment of your asthma? Why?
- What do you wish the SHC on campus would do differently, or better, in helping you to learn about and live with asthma while enrolled here?
- Anything else you would like to add?

K. Focus Group Semi-Structured Focus Group Protocol: Healthcare Providers

As with the student participants, the healthcare provider focus group interview questions will be researcher-generated supplemented with questions that arise from the analysis of the face-to-face interviews and the student focus group interview. The following are some potential focus group interview questions to be asked of the healthcare provider participants:

- In your experience, how knowledgeable are college students on this campus about their asthma?
- In what ways do you think students are learning to self-manage their asthma during their college years?
- What do you think students with asthma expect from the SHC in terms of care and treatment of their asthma? Is it different from a hospital, emergency department, or an urgent care clinic? If so, in what ways?
- In your experience, which comorbidities do you see most often associated with students with asthma? And, how do these affect the care and treatment of asthma?
- Tell me about any opportunities you have had for professional development during your career regarding topics on asthma.
- What, if anything, would you like to know more about treating students with asthma? What additional learning/professional development do you think the SHC could benefit from regarding asthma treatment?
- Which resources do you think are lacking at the SHC that could allow you to better treat and care for students with asthma?
- What do you think TXST could/should do differently to support students who are living with and learning about managing asthma while on campus?
- Is there anything else you would like to add?

L. Definition of Terms

The following are scientific terms used throughout the dissertation and are defined here for the reader.

- *Bronchodilators* - Asthma medications that open the lungs by relaxing airway muscles. They can ease worsening symptoms or stop an asthma attack in progress (www.mayoclinic.org).
- *Complete blood count* - A complete blood count (CBC) is a blood test used to evaluate a patient's overall health and detect a wide range of disorders, including anemia, infection and leukemia. Abnormal increases or decreases in cell counts as revealed in a CBC may indicate that you have an underlying medical condition that calls for further evaluation (mayoclinic.org).
- *Inhaled Corticosteroids* – Anti-inflammatory drugs that are the most effective and commonly used long-term control medications for asthma. They reduce swelling and tightening in your airways (www.mayoclinic.org).
- *Peak Flow Meter* - A portable, easy-to-use device that measures how well your lungs can expel air. By blowing hard through a mouthpiece on one end, the peak flow meter can measure the force of air in liters per minute and give you a reading on a built-in numbered scale (www.mayoclinic.org).
- *Pre and post bronchodilator study* – After performing spirometry testing, the patient inhales a bronchodilator to open air their passages, and then do the spirometry test again. Showing significant improvement after taking the medication could mean the patient may have asthma (www.mayoclinic.org).
- *Spirometry* - A common office test used to assess how well an individual's lungs work by measuring how much air he or she inhales, how much he or she exhales and how quickly he or she exhales. Spirometry is used to diagnose asthma and other conditions that affect breathing. Spirometry may also be used periodically to monitor an individual's lung condition and check whether a treatment for a chronic lung condition is helping you breathe better (www.mayoclinic.org).

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