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Fatimah N. Alobaidi
Georgia State University

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The author of this thesis is:

Fatimah Alobaidi
167 Pine Tree Circle,
Decatur, GA 30317

The director of this thesis is:

Rachel Culbreth, PhD, MPH, RRT
Assistant Professor
Department of Respiratory Therapy
Lewis College of Nursing and Health Professions
Georgia State University
P.O. Box 4019
Atlanta, GA 30302-4019

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THE PERCEPTIONS OF HEALTHCARE STUDENTS TOWARD THE EVIDENCE-BASED PRACTICE OF ASTHMA MANAGEMENT

By

Fatimah Alobaidi, BS

A Thesis

Presented in Partial Fulfilment of Requirements

for the Degree of Master of Science

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in the Department of Respiratory Therapy

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ABSTRACT

The Perceptions of Healthcare Students toward the Evidence-Based Practice of Asthma Management

By

Fatimah Alobaidi, BS
(Under the Direction of Dr. Rachel Culbreth)

BACKGROUND: Despite the growing research work regarding asthma perceptions among different populations, healthcare professional students' perceptions have not previously been examined. Therefore, it is important to assess healthcare students' perceptions towards the evidence-based practice of asthma management to address the need for designing a targeted intervention to improve understanding of evidence-based management of asthma in college settings. **PURPOSE:** The aim of the study was to evaluate the Healthcare students' perceptions Towards the evidence-based practice of asthma management. **METHODS:** Data were collected through self-administered survey. **RESULTS:** Sixty students (N=60) were surveyed from three majors: nursing students accounted for 78.3%; followed by respiratory therapy students 15%; and nutrition students 6.7%. The majority of respondents were female (88.3%), while only seven were male (11.7%). 26.7% of the participants self-declared that they had been diagnosed with asthma. Almost half of the sample had no experience in healththerapy (53.3%). Only three participants (5%) were often treating asthma patients while more than half of the participants had never treated asthma patients (68.3%). The findings revealed that healthcare students reported the strongest agreement on the importance of recognizing the signs and symptoms of asthma with a total mean score of 6.85 (SD±.404). Students who had clinical experience demonstrated significantly greater understanding of asthma treatment than those who had no clinical experience (p=.044). The study showed that students who never treated asthma patients had significantly lower knowledge about the causes of asthma (p=.039), signs and symptoms of asthma (p=.004), and the treatment of asthma (p=.005). Asthmatic students rated their knowledge about the signs and symptoms, and treatment of asthma significantly higher than non-asthmatic students (p=.005, p=.014, respectively). **CONCLUSIONS:** Healthcare students have positive perceptions toward the evidence-based practice of asthma management. Further research with larger sample size, various healthcare professions, and different educational institutions is recommended.

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Chapter I

INTRODUCTION

Asthma is a complex chronic airway disorder and one of the most prevalent respiratory diseases worldwide. It affects around 339 million world population (Vos et al., 2017). Approximately nineteen million US populations are asthma patients, and 8.7% are college students (CDC, 2018). Asthma is marked by recurrent symptoms that vary in severity among patients. Wheezing and chest tightness are common symptoms in more than 90% of asthma patients (Globe et al., 2015). Although asthma-related deaths are uncommon and contribute 1% of deaths around the US (Global Asthma Network, 2014; CDC, 2018), the severity of the symptoms and hospital admission rate is increasing over the years. There was around five hundred thousand emergency admission for patients with an asthma attack in the UK within ten years (Gupta et al., 2018). As per the Center for Disease Control and Prevention estimate, almost two million ER visits in the US are attributed to asthma (CDC, 2018). Poorly managed asthma is always correlated with a decline in academic performance (Reynolds et al., 2018). Koinis-Mitchell and colleagues (2019) reported that asthma severity is inversely proportional to schoolwork quality (p=.01). Furthermore, the lack of control over asthma symptoms negatively impacts life quality (Petsios et al., 2013). Alpaydin and colleagues (2012) found a significant relationship between the results of the Asthma Quality of Life Questionnaire and the Asthma Control Test, which emphasizes the effect of uncontrolled asthma over the quality of life.

The sustained increase in asthma prevalence and symptom severity emphasizes the need for evidence-based strategies to manage asthma effectively. The National Heart, Lung, and Blood Institute (NHLBI), in cooperation with the expert committee of the National Asthma Education and Prevention Program (NAEPP), developed guidelines for diagnosing and managing asthma

patients. The expert panel aimed to optimize asthma quality of life and healthcare management. The guidelines focus on four main elements: diagnosing and monitoring asthma patients, identifying and controlling asthma triggers, education and self-management, and initiating treatment plans (National Asthma Education and Prevention Program (NAEPP), 2012). Global Initiative for Asthma (GINA) is another national institute that annually convenes an updated guideline to help healthcare providers optimizing patients' conditions. GINA aims to raise public awareness about asthma and provide up-to-date feasible strategies to manage asthma (Global Initiative for Asthma, 2020). To bridge the gap between the continuous advancement in asthma management and patient level of knowledge, specialized asthma personnel must educate asthma patients and provide a convenient treatment plan. National Asthma Educator Certification Board (NAECB) created the Asthma Educator Certificate (AE-C) to impart knowledge to the patients through qualified asthma instructors. According to the NAECB (2020), licensed healthcare professionals from different disciplines, such as physicians, pharmacists, physical therapists, respiratory therapists, social workers, health educators, and occupational therapists, are potential candidates to take the asthma educator exam. Certified Asthma educators possess profound knowledge about the etiology and pathophysiology of asthma. Also, Asthma educators can diagnose, monitor, and customize the plan of care to the patient preference. Asthma educators aim to manage the cultural, environmental, and socioeconomic impacts on asthma status and improve patients' quality of life (National Asthma Educator Certification Board, 2020).

Asthma knowledge is a crucial component to effectively control asthma (National Asthma Education and Prevention Program, 2003). At the school level, asthma education improves students' knowledge and quality of life and reduces absences (National Heart, Lung, and Blood Institute, 2014). Kocaaslan & Akgün Kostak (2019) reported that after attending two months of

school-based asthma education program, the student's quality of life and self-efficacy significantly increased (p=.0014). NHLBI strongly advised schools to provide asthma education programs to their asthmatic and non-asthmatic students to create an asthma-friendly environment at schools and prepare all students to deal with potential asthma emergencies (National Heart, Lung, and Blood Institute, 2014). At the healthcare services level, the necessity of expanding asthma knowledge is that healthcare professions work on a team to provide care and education to asthma patients. When specialized asthma nurses provided a hospital-based asthma education program, hospital readmissions for asthmatic patients significantly reduced (p=.04) (Castro et al., 2003). Pharmacist-delivered asthma education programs significantly improved patients' knowledge and peak flow meter measurements (Hsu et al., 2018). Aftab and colleagues (2014) found that 74% of the ER physicians had sufficient knowledge of asthma guidelines and used evidence-based strategies in their care plan. Thus, NAEP urges healthcare providers to expand their knowledge and establish asthma education programs (National Asthma Education and Prevention Program (NAEPP), 2012).

PURPOSE

The purpose of this study was to compare the level of asthma knowledge among an interdisciplinary sample of healthcare professional students at Georgia State University. The study will also evaluate the understanding of asthma guidelines among healthcare professional students. Furthermore, the study will examine the relationship between the experience of treating asthma patients and the knowledge of asthma among healthcare professional students.

STUDY QUESTIONS

Three questions were used as a guide in this study:

1. What are the perceptions of healthcare professional students toward the evidence-based practices of asthma management?
2. Are Respiratory Therapy students more familiar with asthma guidelines than other healthcare professional students?
3. Do experienced students treating asthma have a higher level of knowledge of asthma guidelines than less experienced students?

SIGNIFICANCE

Many studies examined the level of asthma understanding among school-aged children. There is a vast body of literature investigating asthma knowledge among a variety of healthcare professionals. Despite the growing research work about asthma perceptions among different populations, Healthcare professional students have not previously been examined. No study to our knowledge has assessed the level of asthma knowledge among an interdisciplinary sample of healthcare professional students. This study will contribute to evaluating the understanding of asthma management among students in different healthcare specialties. This study aims to examine the relationship between the experience of treating asthma patients and understanding asthma guidelines among healthcare students. Ultimately, this study will address the need to establish an asthma education course in healthcare professional colleges.

CHAPTER II

LITERATURE REVIEW

The following literature review covers many areas in the evidence-based management of asthma and asthma perceptions among healthcare professionals and students. The online databases that were searched for this review include EBSCOhost, PubMed, and Ovid. Search keywords used were: Asthma perceptions, Asthma knowledge, Asthma awareness, Asthma understanding, Evidence-based practices of asthma, asthma guidelines, Asthma management, the National Asthma Education and Prevention Program, Global initiatives for asthma, college students and asthma, healthcare students, and asthma, healthcare providers and asthma. The search revealed a vast body of relevant literature that explores the level of asthma awareness among different populations. This chapter investigated the following matters:

- Asthma overview.
- Evidence-based practices in asthma management.
- Knowledge and attitudes towards evidence-based practices for asthma among healthcare professionals.
- The perceptions of college students towards asthma management.

Asthma Overview:

Papi and colleagues (2018) define asthma as a chronic, non-contagious airways disorder induced by a combination of genetic and environmental factors. Asthmatic patients manifest variable airflow limitations and recurrent flare-ups. Asthma is a common and prevalent condition among people of all ages. According to CDC (2018), the Asthma prevalence among Americans is an estimated 25 million, with a median prevalence of about 1 in 13 Americans. In the United

States, approximately 8% of adults are diagnosed with asthma, and 7.5% of children are asthmatics. From 1999 to 2015, asthma-related deaths have decreased from 2 to 1.2 per 100,000 ($p<0.001$) (Pennington et al., 2019). However, the decline in asthma mortality was associated with a sharp increase in disease expenditure (CDC, 2018).

Asthma imposes enormous burdens on patients and the healthcare system that encompasses direct and indirect costs (Bahadori et al., 2009; Nunes et al., 2017). The annual per capita direct cost averaged $2,500, and the greatest portion accounted for asthma medications and hospital admission; 50% and 15%, respectively (Cisternas et al., 2003; Nurmagambetov et al., 2018). These indirect costs include loss of productivity and absenteeism among asthmatic workers and students. Over five years, missed school and work days due to asthma accounted for $3 billion (Nurmagambetov et al., 2018). Moreover, the level of control over asthma symptoms disproportionately affects asthma expenditures. A considerable economic burden is attributable to poorly controlled asthma due to the increased use of medical resources (Yaghoubi et al., 2019; Sullivan et al., 2014; Antonicelli et al., 2004). Thus, Yaghoubi et al. (2019) and Bahadori et al. (2009) emphasize the role of evidence-based asthma management strategies in reducing the economic burden of asthma.

Evidence-based practices in asthma management:

Evidence-based practices (EBP) are strategies used to manage health conditions supported by high-level evidence from reliable, peer-reviewed papers. Besides the clinicians' expertise, EBP emphasizes the long-term outcomes of medical interventions in terms of quality of life, mortality, and morbidity. Implementing EPB leads to desirable consequences, including providing high-quality care, improving patient outcomes, enhancing clinicians' satisfaction, and reducing medical expenses. The growing prevalence and debilitating burdens of asthma stress

the importance of applying EBP in asthma management (Melnyk et al., 2010; Kallstrom, 2004). On both a national and international level, an effort has been devoted to developing clinical practice guidelines to reduce morbidity, mortality, and asthma impact on patients' lives (Becker & Abrams, 2017; Myers, 2008). In the following paragraphs, we will discuss the two most recognized evidence-based asthma management guidelines in the United States: The Expert Panel Report and the Global Initiative for Asthma.

The National Heart, Lung, and Blood Institute (NHLBI), in collaboration with the coordinating committee of the National Asthma Education and Prevention Program (NAEPP), issued a profound guideline entitled Expert Panel Report (EPR) for diagnosing and managing asthma. The Expert Panel Report is periodically revised and updated to reflect the most recent rigorous evidence, while the most recent update was the Expert Panel Report-3 published in 2007. The goal of the EPR-3 is to control asthma status and minimize asthma manifestations in the patient's daily life. EPR-3 guidelines summarize effective asthma management in four essential components: the assessment and monitoring of asthma, education, controlling asthma triggers, and asthma treatment. In a stepwise approach, these four components are incorporated to maintain asthma status by intensifying treatment for uncontrolled asthma and reducing treatment as soon as the ultimate control of asthma has been achieved.

According to the EPR-3 guidelines (2012), assessing asthma severity is the first step in initiating a treatment plan tailored to the patient's condition, followed by continuous evaluation and adjustment to the therapy until the optimum goal of asthma management is achieved. Education and self-management skills are essential components of effective asthma management and depend solely on the relationship between healthcare providers and patients. Establishing a solid connection between the patient and clinician helps address the patient's concerns and develop a

plan of care and attainable goals based on the patient's preference. Asthma education involves providing a written asthma action plan, particularly for poorly controlled asthma patients, that illustrates daily medications' instructions, triggers control and manages exacerbations. NAEPP experts suggest taking a copy of the written asthma action plan to the healthcare provider at a school or daycare to remain aware of the proper actions in dealing with an asthma patient. The education component also includes developing asthma self-management skills. EPR-3 guidelines demonstrate that asthma self-management education requires repetition and encouragement and involves all healthcare practitioners who interact with asthma patients at all levels, including physicians, respiratory therapists, nurses, pharmacists, and asthma educators.

Furthermore, EPR-3 guidelines address identifying asthma aggravating factors and treating comorbidities as essential in effective asthma management. Exposure to inhaled allergens and drugs such as non-steroidal anti-inflammatory drugs and aspirin may worsen asthma symptoms and increase the risk of exacerbations. Reviewing a patient's medical history is crucial to identifying and treating comorbid conditions that negatively affect asthma status. Gastroesophageal reflux (GERD), for instance, is strongly associated with nighttime asthma symptoms, and managing GERD consequently minimizes the risk of asthma attacks and reduces the need for asthma medications (National Asthma Education and Prevention Program (NAEPP), 2012).

Moreover, managing asthma relies heavily on the use of medications. EPR-3 guidelines classify asthma medications into two categories: long-term therapy and quick-relief medications. The mechanism of action of long-term therapy includes treating underlying inflammation, which is intended to maintain asthma control and reduce the incidence of asthma attacks. Inhaled corticosteroid (ICS) is the most effective long-term therapy for adults and children that can be

administered alone or in combination with long-acting beta-agonist (LABA) drugs. Quick-relief medications provide instant relief for acute asthma symptoms and involve three types of medications: Short-Acting Beta-Agonist drugs (SABA), anticholinergics, and systemic corticosteroids. The guidelines highlight the differences and features of each medication. For instance, the EPR-3 guidelines consider SABA medications as the treatment of choice to manage exacerbations since it instantly relaxes the airways' smooth muscles, while anticholinergics work in different mechanisms and induce bronchodilation by preventing smooth muscle constriction. NAEPP experts state that close monitoring is required to identify both signs of improvement and the adverse effects of asthma treatment. Besides, selecting a medication delivery system depends on the form of medication and patient preference and ability. EPR-3 experts highly recommend reviewing the proper use of the delivery system and reassessing patient knowledge and adherence at every visit.

In 1993, the World Health Organization (WHO), in collaboration with the National Heart, Lung, and Blood Institute (NHLBI), launched the Global Initiative for Asthma (GINA). GINA is an international network of asthma experts and organizations aiming to raise awareness about asthma among healthcare practitioners, asthma patients, and the community. Annually, GINA updates and issues a report on asthma management and prevention strategies based on up-to-date evidence from meta-analysis and randomized controlled trials.

According to the GINA report (2020), asthma management goals are to maintain patient quality of life, minimize the risk of asthma flare-ups, and maintain control over asthma symptoms. GINA introduced the concept of personalized care in asthma management through a sequence of three steps, which include assessment, adjustment, and response review by trained asthma personnel. In the same manner, as ERP-3, GINA guidelines focus on the evaluation of

asthma severity as an initial step in the plan of care for asthma patients and their treatment options. Treatment selection and patient education depend on the level of asthma severity and asthma's impact on daily patient performance. The treatment adjustment step includes modifying both pharmacological and non-pharmacological strategies according to the asthma status's improvement and worsening. Finally, reviewing the patient's response to the personalized asthma plan is the third step in GINA guidelines for asthma management that includes evaluating patient satisfaction, lung function, drug side effects, and recurrence of the symptoms. GINA (2020) highly recommends delivering asthma care through well-trained healthcare providers, especially for uncontrolled asthma patients.

Knowledge and attitudes towards evidence-based practices for asthma among healthcare professionals:

Clinicians' knowledge and attitude to evidence-based strategies are critical in translating guideline recommendations into desired outcomes. In a cross-sectional study, Alrabiah et al. (2018) assessed the level of knowledge and implementation of GINA guidelines and locally adapted guidelines among primary care physicians in Saudi Arabia. Two hundred forty-six physicians completed a self-administered 18-item survey. The researchers considered a score of 70% as the minimum acceptable level for both the guidelines' knowledge and implementation. Approximately 70% of the participants utilized GINA guidelines for asthma management, and 22% of the participants followed a locally adapted guideline. The study's findings revealed that 93% of the primary care physicians had a significantly low level of knowledge ($p<.001$). Additionally, the average implementation of the guidelines was below the acceptable level (68.6%, $p=0.067$); however, the consultants showed higher adherence to the guidelines than general practitioners. The researchers deduced a serious gap between the knowledge and

application of evidence-based asthma management practices, which may be responsible for uncontrolled asthma in Saudi Arabia.

Similarly, in the United States, Wisnivesky and colleagues (2008) surveyed 202 healthcare providers, including nurse practitioners, residents, and internal medicine fellows, to investigate their knowledge and familiarity with the NHLBI asthma guidelines. Though 70% of the participants were aware of the NHLBI guidelines, only 46% followed the guidelines. The researchers evaluated the HCPs' beliefs on specific components of NHBLI guidelines, including using a written asthma action plan. 59% of the HCPs were uncertain about the effectiveness of the written asthma action plan in managing asthma, suggesting that the lack of guideline adherence can be attributed to the poor outcome expectancy of HCPs, which reflects a low level of understanding for evidence-based practices regarding asthma management.

O'Laughlen and associates (2013) conducted a cross-sectional descriptive study to explore the nurse's knowledge and attitude toward the NAEPP guidelines. The researchers surveyed 225 nurses across the United States and compared the findings to the physicians' data from previous research conducted by Cabana et al. (2001). The study examined general awareness, adherence, familiarity, agreement, confidence, and outcome expectancy regarding three recommendations of the NAEPP guidelines: daily inhaled corticosteroids (ICS), the use of peak flow meters (PFM), and smoking counseling. The researchers reported that the nurses had a higher level of awareness about the NAEPP guidelines than physicians. However, accessibility to the guidelines was slightly more limited to nurses and not to physicians. Also, nurses exhibited higher adherence and familiarity with the guidelines' recommendations than physicians and specifically to the daily use of ICS and smoking cessation counseling. Surprisingly, there was a significant difference in the agreement on using PFM for monitoring between nurses and physicians (73%

vs. 92%). Also, the nurses were less confident than the physicians about titrating asthma treatment according to the peak flow meter measurements.

In Australia, Watkins and associates (2016) evaluated the utilization of SABA and Asthma Action Plan (AAP) guidelines. Out of 57 participants, 19 pharmacists and five asthma educators were recruited into discussion sessions. Both pharmacists and asthma educators have shown a positive attitude toward SABA and AAP card guidelines. The researchers also found that pharmacists and educators had a high level of awareness about the AAP card guidelines; however, only 49% had used it in patient care. Thus, the variation in knowledge and attitude among HCPs results in inconsistent implementation of evidence-based practices on asthma management.

Healthcare providers can enhance their understanding and practice of asthma management by pursuing further education and earning specialized credentials. Asthma Educator board certification launched by NAEPP to promote advancement in asthma management and ensure delivering specialized care to asthma patients (National Asthma Educator Certification Board, 2020). Cicutto and associates (2005) reported that Certified asthma educators from nursing, pharmacy, respiratory therapy, and physical therapy achieved high levels in practice skill assessment and written asthma knowledge (score >80%). Researchers also found that experience of treating asthma patients was associated with asthma teaching skills. Moreover, translating specialized knowledge of asthma into clinical practice has led to favorable outcomes in the clinical setting. A study conducted by Abraham and colleagues (2019) revealed that care provided by certified asthma educator pharmacists significantly improved patient adherence to asthma treatment as well as decreased hospitalization rates.

The perceptions of college students toward asthma management:

In 2008, Urrutia-Pereira and colleagues investigated the level of knowledge about asthma, anaphylaxis, and food allergy among teachers, caregivers, and college students in Brazil. Five hundred seventy-seven participants were randomly enrolled in the study, and 299 were college students with an average age of 30 years. Researchers classified the college students into two groups based on their course: group 1 composed of medicine, nursing, and physiotherapy students (N=181) and group 2 composed of pharmacy and physical education students (N=118). The Newcastle Asthma Knowledge Questionnaire was translated into the Brazilian language and assessed asthma knowledge among participants. The researchers reported that most college students named at least one of the asthma symptoms, and 71% knew asthma triggers; however, pharmacy and physical education students showed a statistically higher level of knowledge in asthma triggers than group 1. In addition, 88% of students knew about two types of asthma inhaled medications: rescue and maintenance medications. Surprisingly, 75% of the students thought that SABA might cause addiction, and only 34% believed that using inhaled medications reduces systemic side-effects. Almost half of the students reported that using MDI with a spacer tended to hinder the medication from reaching the lungs. Nevertheless, there was no statistical difference between the college students' groups in their knowledge of the pharmaceutical management of asthma.

Al-Obaidi and associates (2020) conducted a survey-based study to evaluate the level of knowledge of rhinitis and asthma among biotechnology students in Iraq. Four hundred three students at the University of Baghdad were randomly recruited to answer an 11-item questionnaire. The findings revealed that students had moderate overall knowledge about asthma and rhinitis, with an average score of 38%. Nonetheless, only 17% of the students had an

adequate level of knowledge about asthma medications. Researchers deduced that asthma education programs are required to enhance asthma awareness among college students. A similar result has been observed in another study, a cross-sectional descriptive study conducted by Puerto Fuentes & Cardona (2020), to evaluate the level of asthma knowledge and management among undergraduate medical students in Colombia. One-thousand students from eight different universities were randomly selected to participate in the study. Researchers reported no statistical difference in the pathophysiology of asthma between private and public university students. However, a significant difference was observed in the awareness of the pharmaceutical management of asthma. Interestingly, 17% of students frequently attend asthma education sessions. Likewise, the authors concluded that ongoing education is needed to improve college students' knowledge about asthma management.

Researchers believe that asthma management for college students is a neglected area of research (Levy, 2015). A study designed to assess asthma severity, impact, and management among college students in the United States, Reece and colleagues (2002) selected 215 asthmatic college students to fill out a 42-item questionnaire. Participants were classified based on asthma severity: 23% had severe asthma, 59% had moderate asthma, and 19% had mild asthma. Asthma management was evaluated in terms of utilizing university healthcare services, asthma medications, monitoring, and receiving a flu vaccine. Researchers reported that the severity of asthma was associated with the frequency of using university healthcare services. The majority of the participants had scheduled routine clinic visits. 75% of the participants were instructed on the proper use of inhalers. Surprisingly, 38% of the severely asthmatic students received instruction on using a peak flow meter to monitor asthma symptoms. Further, only 15% used the peak flow meter when they had symptoms, which indicates a low level of awareness about

asthma monitoring. 22% of participants received free flu vaccines as part of their asthma care at the university clinic. The authors deduced that asthmatic college students received insufficient care in the college setting.

Conclusion:

Asthma is a prevalent chronic inflammatory airways disorder that imposes a fiscal burden on patients and healthcare institutions. National and international initiatives have designed clinical practice guidelines based on substantial, up-to-date evidence to improve asthma care and relieve asthma burdens. Both EPR-3 and GINA guidelines aim to raise asthma awareness and facilitate healthcare providers' understanding of asthma management. These asthma guidelines attempt to bridge the gap between the current evidence and clinical practices for clinicians and patients. A significant variation in the level of knowledge of asthma guidelines was observed among different healthcare professionals, resulting in disparities in guidelines implementations, which subsequently led to inconsistent quality of care (Alrabiah et al., 2018; O'Laughlen et al., 2013). Although clinicians showed a positive attitude toward evidence-based strategies, the lack of understanding resulted in poor outcome-expectancy, hence, inadequate implementation of the guidelines (Wisnivesky et al., 2008). Moreover, perceptions of asthma management among college students are poorly studied. However, relevant literature demonstrates that the level of knowledge is unacceptable among different healthcare professionals, particularly on medication and monitoring components of asthma management (Urrutia-Pereira et al., 2018; Reece et al., 2002).

CHAPTER III
METHODOLOGY

In this descriptive study, the researcher explored undergraduate students' perceptions at Georgia State University regarding evidence-based practices in asthma management. The researcher used a self-administered survey to investigate the perceptions of students in various healthcare disciplines, including nursing, respiratory therapy, physical therapy, occupational therapy, nutrition therapy, and health informatics. This chapter discusses the method and procedures applied in this study.

Research Questions

1. What are the perceptions of healthcare professional students toward the evidence-based practices of asthma management?
2. Are Respiratory therapy students more familiar with asthma guidelines than other healthcare professional students?
3. Do experienced students treating asthma have a higher level of knowledge of asthma guidelines than less experienced students?

Instrumentation

The instrument used in this study is a 22-item survey developed based on preliminary work conducted by Dr. Douglas Gardenhire of Georgia State University in Atlanta, Georgia. After obtaining the professor's permission, the instrument was edited to provide an accurate assessment of students' perceptions and attitudes towards asthma management. The instrument consists of two sections distributed to healthcare professionals' students (Appendix A).

Section I consists of fifteen questions evaluating a student's perspective and adherence to national asthma guidelines. Perceptions of asthma knowledge and utilization of the Global Initiative for Asthma (GINA) guidelines were obtained regarding asthma etiology, clinical manifestations, asthma treatment, GINA guidelines awareness, continuing education on asthma, and peer recognition. A Seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) was used to assess students' perceptions. Likert rating scales are a commonly used method that conveys participants' attitudes and the degree of agreement or disagreement with a statement (Sullivan & Artino, 2013). Section II consists of four questions concerning demographics, asthma diagnosis, and the experience of treating asthma patients.

Research Design

This study uses a cross-sectional design with a self-administered survey delivered electronically. Surveys are one of the most feasible data collection techniques in scientific studies (Burns et al., 2008). The survey is being distributed to potential participants via university email. The rationale behind conducting a survey-based study is to collect a large amount of data from many potential participants using a single tool. Moreover, electronic surveys offer a cost and time-effective approach to gathering data (Sax et al., 2003).

Sample

A convenience sample was used in this cross-sectional study; participants were recruited in accordance with the availability. The target population includes undergraduate students enrolled in nursing, respiratory therapy, and nutrition therapy at both the Atlanta and Perimeter campuses of Georgia State University. The exclusion criteria include participants who were enrolled in graduate programs, including master's or doctorate programs, at the time of conducting the study.

Protection of Human Subjects

The research proposal will be reviewed by Georgia State University Institutional Review Board (IRB) to protect human subjects' rights. To protect confidentiality, participants will be anonymous, and no personal identification data will be used in this study. Study participation will be voluntary, and consent is assumed upon return of a completed survey.

Data Analysis

The Statistical Packages for the Social Sciences (SPSS) program, version 25, was used to analyze the collected data for each participant. Descriptive statistics, including mean, frequency, percentage, and standard deviation, were computed to assess the normality of the sample and identify differences among the participants. ANOVA tests were conducted to determine statistically significant differences in the familiarity with asthma guidelines between respiratory therapy students and other healthcare students. The Mann-Whitney U test was used to assess the statistical differences in the experience of treating asthma patients and the level of asthma knowledge among healthcare students. A Spearman correlation was applied to evaluate the association between years of experience and asthma knowledge in a multidisciplinary sample of healthcare students.

Chapter IV

Findings

The purpose of this chapter was to evaluate Healthcare students' perceptions toward the evidence-based management of asthma and to differentiate between students' knowledge based on their major.

Research Questions:

1. What are the perceptions of healthcare professional students toward the evidence-based practices of asthma management?

2. Are Respiratory therapy students more familiar with asthma guidelines than other healthcare professional students?

3. Do experienced students treating asthma have a higher level of knowledge of asthma guidelines than less experienced students?

Demographic findings:

The study included a convenient sample of undergraduate healthcare students at the Atlanta and Perimeter campuses of Georgia State University. A total of 60 individuals from three majors participated: nursing, nutrition, and respiratory therapy. The majority of the respondents were nursing students n=47 (78.3%); followed by respiratory therapy students n=9 (15%); and nutrition students n=4 (6.7%). The majority of respondents were female, n=53 (88.3%), while only seven were male (11.7%). The mean age of participants was 24.32 (SD±7.8). Sixteen participants (26.7%) self-declared that they had been diagnosed with asthma, while forty-four of

the participants (73.3%) recorded that they had not been diagnosed with asthma. 50%, 27.7%, and 11.1% of nutrition, nursing, and respiratory therapy students reported having asthma, respectively. (See table 1)

Table1: frequencies and percentages for sample demographics

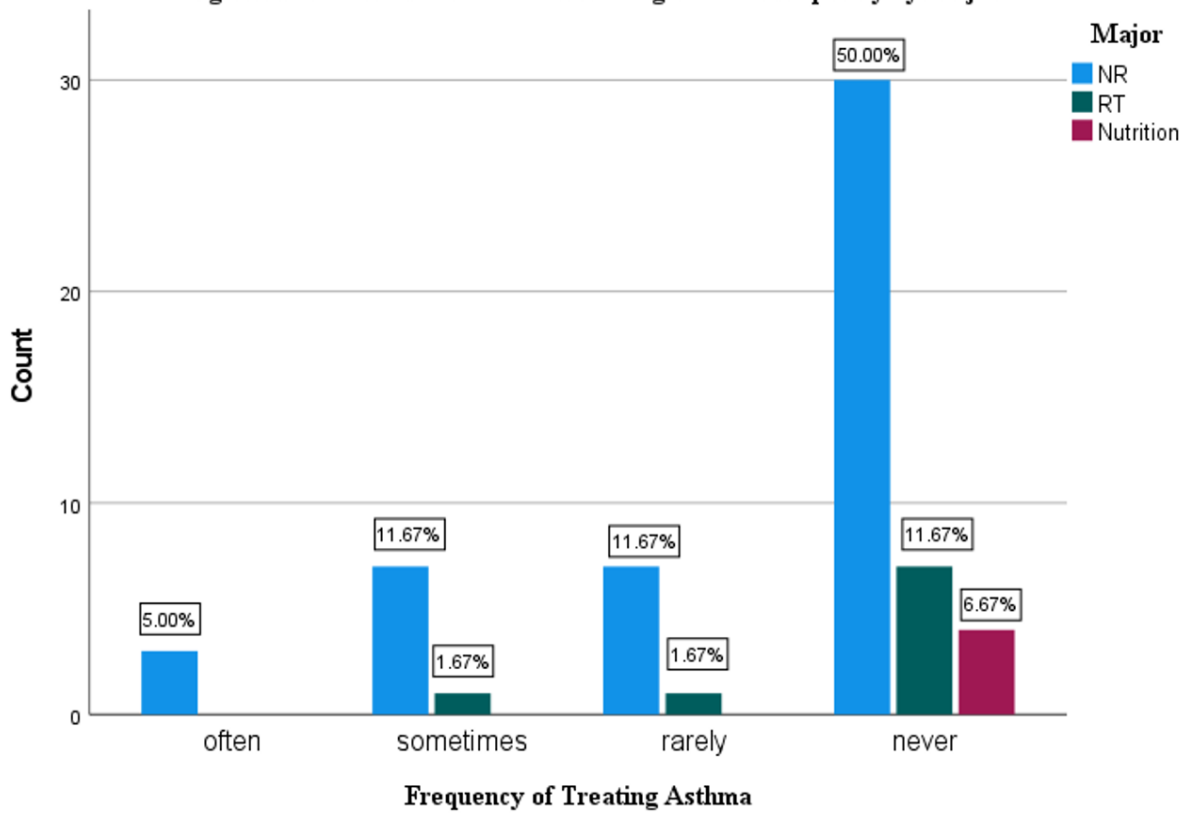
Demographic Variable	Nursing N= 47 (78.3%)	Nutrition N=4 (6.7%)	Respiratory Therapy N=9 (15%)	Total N=60 (100%)
Gender				
Male (%)	5 (10.6%)	1 (25%)	1 (11.1%)	7 (11.7%)
Female (%)	42 (89.4%)	3 (75%)	8 (88.9%)	53 (88.3%)
Mean Age (±SD)	24.5(±8.2)	27.25(±10.6)	22.0(±3.5)	24.32(±7.8)
Diagnosed with Asthma				
Yes (%)	13 (27.7%)	2 (50%)	1 (11.1%)	16 (26.7%)
No (%)	34 (72.3%)	2 (50%)	8 (88.9%)	44 (73.3%)
Frequency of treating asthma patients				
Often (%)	3 (6.4%)	0 (0%)	0 (0%)	3 (5%)
Sometimes (%)	7 (14.9%)	0 (0%)	1 (11.1%)	8 (13.3%)
Rarely (%)	7 (14.9%)	0 (0%)	1 (11.1%)	8 (13.3%)
Never (%)	30 (63.8%)	4 (100%)	7 (77.8%)	41 (68.4%)
Experience in healthcare				
Yes (%)	24 (51.1%)	1 (25%)	3 (33.3%)	28 (46.7%)
No (%)	23 (48.9%)	3 (75%)	6 (66.7%)	32 (53.3%)
Mean years of experience (±SD)	3.5 (±4.5)	3.0	1.0 (±0.00)	3.21 (±4.2)

In response to a questionnaire item asking about the frequency of treating asthma patients, more than half of the participants had never treated asthma patients n=41 (68.3%), including all nutrition students (100%), 63.8% of nursing, and 77.8% of respiratory therapy students. Meanwhile, three participants (5%) often treated asthma patients who were nursing

students. 14.9% of nursing students and 11.1% of respiratory therapy students reported sometimes treating asthma patients. Similarly, 14.9% and 11.1% of nursing and respiratory therapy students rarely treated patients with asthma. (See table 1 and figure 1).

Approximately half of the sample had no experience in healthcare n=32 (53.3%), while twenty-eight participants reported that they had clinical experience (46.7%) with mean years of experience of 3.21 (±4.2). The majority of those with expertise in healthcare were nursing students n=24 (85.7%), followed by respiratory therapy students n=3 (10.7%) and nutrition students n=1 (3.5%). (See table 1)

Figuer 1: Clustered Bar Count of Treating Asthma Frequency by Major



NR: Nursing, RT: Respiratory Therapy.

Finding Related to Research Question 1

The first question asked, "What are the perceptions of healthcare professional students toward the evidence-based practices of asthma management?" Data results were tabulated in Table 3, which includes item numbers in the survey, survey statements, the mean score and standard deviation of perceptions of all healthcare students participating in the study, and students' perceptions of nursing, respiratory therapy, and nutrition majors. Table 3 ranks the findings of healthcare students' perceptions toward evidence-based practices of asthma management from the highest to the lowest total mean scores. (See table 2).

Generally, healthcare students reported the strongest agreement to the statement that "It is important for me to recognize common signs and symptoms of asthma as a healthcare student" with a total mean score of M=6.85 and standard deviation of (SD±.404). Whereas the statement that "I attend continuing education offerings on asthma and asthma management" got the least agreement in response with a total mean score of M=3.72 and standard deviation of (SD±2.457). (See table 2).

Likewise, the findings show that nursing students have positive perceptions toward evidence-based practices of asthma management and their highest agreement was to the statement that "It is important for me to recognize common signs and symptoms of asthma as a healthcare student" with a mean score of M= 6.85 (SD±.360). In contrast, their lowest agreement was to the statement that "I attend continuing education offerings on asthma and asthma management," with a mean score of M=3.43 (SD±2.447). (See table 2).

Moreover, the findings show that respiratory therapy students have a positive response toward evidence-based management of asthma. Respiratory therapy students demonstrated the most

robust agreement to two statements which were: "It is important for me to recognize common signs and symptoms of asthma as a healthcare student," and "It is important for me to understand the treatment of asthma as a healthcare student" with mean score and standard deviation of 6.78 (±.667). Nevertheless, respiratory therapy students least agreed to utilize the Global Initiative for Asthma (GINA) guidelines as healthcare students with a mean score of M= 4.11 (±2.205). (See table 2).

The study also reported that nutrition students have a positive perception of the evidence-based practices of asthma management. Their highest agreement was to two statements that "It is important for me to recognize common signs and symptoms of asthma as a healthcare student" and "It is important for me to understand the treatment of asthma as a healthcare student" with a mean score of M=7.00(SD±.000). While the nutrition students' least agreement was in the statement that "My peers believe that I should attend continuing education offerings on asthma and asthma management" with a mean score of 4.50 (±2.646). (See table 2).

Table 2: Findings Related to Research Question1: Healthcare students' perceptions toward evidence-based management of asthma

Item No.	Survey Statement	Total Mean (±SD)	Nursing Mean (±SD)	Respiratory Therapy Mean (±SD)	Nutrition Mean (±SD)
2	**It is important for me to recognize common signs and symptoms of asthma as a healthcare student.**	6.85 (±.404)*	6.85 (±.360)*	6.78 (±.667)*	7.00 (±.000)*
3	**It is important for me to understand the treatment of asthma as a healthcare student.**	6.77 (±.563)	6.74 (±.570)	6.78 (±.667)*	7.00 (±.000)*
1	**It is important for me to identify the causes of asthma as a healthcare student.**	6.67 (±.57)	6.68 (±.556)	6.78 (±.441)*	6.25 (±.957)
4	**It is important for me to utilize the Global Initiative for Asthma (GINA) guidelines as a healthcare student.**	6.24 (±.950)	6.28 (±.971)	6.11 (±.928)	6.25 (±.957)
5	**It is important for me to attend continuing education offerings on asthma and asthma management.**	5.97 (±1.207)	5.98 (±1.189)	6.22 (±1.202)	5.25 (±1.500)
7	**My peers believe that I should recognize common signs and symptoms of asthma as a healthcare student.**	5.97 (±1.178)	5.96 (±1.062)	6.22 (±1.716)	5.50 (±1.291)
8	**My peers believe that I should understand the treatment of asthma as a healthcare student.**	5.97 (±1.221)	5.98 (±1.132)	6.11 (±1.691)	5.50 (±1.291)
6	**My peers believe that I should understand the causes of asthma as a healthcare student.**	5.85 (±1.313)	5.98 (±1.151)	5.67 (±1.871)	4.75 (±1.500)
12	**I recognize common signs and symptoms of asthma as a healthcare student.**	5.72 (±1.530)	5.66 (±1.632)	6.00 (±.707)	5.75 (±1.893)
13	**I understand the treatment of asthma as a healthcare student.**	5.55 (±1.599)	5.53 (±1.640)	5.56 (±1.424)	5.75 (±1.893)
11	**I understand the causes of asthma as a healthcare student.**	5.53 (±1.620)	5.47 (±1.653)	5.78 (±1.093)	5.75 (±2.500)
10	**My peers believe that I should attend continuing education offerings on asthma and asthma management.**	5.38 (±1.574)	5.45 (±1.411)	5.44 (±1.944)	4.50 (±2.646)+
9	**My peers believe that I should utilize the Global Initiative for Asthma (GINA) guidelines as a healthcare student.**	5.20 (±1.592)	5.26 (±1.567)	5.00 (±1.803)	5.00 (±1.826)
14	**I utilize the Global Initiative for Asthma (GINA) guidelines as a healthcare student.**	3.97 (±2.365)	3.85 (±2.386)	4.11 (±2.205)+	5.00 (±2.828)
15	**I attend continuing education offerings on asthma and asthma management.**	3.72 (±2.457)+	3.43 (±2.447)+	4.67 (±2.179)	5.00 (±2.828)

SD: Standard Deviation.

(*): Highest Score, (+): Lowest Score.

Note: Means are based on a 7-point Likert-scale in which 1 indicates strongly disagree and 7 indicates strongly agree. Score above 4.5 indicates agreement with the statement

Findings Related to Research Question 2:

The second question asked, "Are Respiratory therapy students more familiar with asthma guidelines than other healthcare professional students?" Responses to three survey statements regarding familiarity with asthma guidelines were tabulated and presented in table 3. There was no significant difference in the familiarity with asthma guidelines between respiratory therapy students and other healthcare students, including nursing and nutrition students. (See table 3).

Table 3: Findings related to research Question 2: Respiratory Therapy students' familiarity with asthma guidelines in comparison to other healthcare students

Item No.	Survey statement	Respiratory Therapy N=9	Nursing N=47	Nutrition N=4	*P*-value
		Mean (±SD)	Mean (±SD)	Mean (±SD)	
4	**It is important for me to utilize the Global Initiative for Asthma (GINA) guidelines as a healthcare student.**	6.11 (±.928)	6.28 (±.971)	6.25 (±.957)	.895
9	**My peers believe that I should utilize the Global Initiative for Asthma (GINA) guidelines as a healthcare student.**	5.00 (±1.803)	5.26 (±1.567)	5.00 (±1.826)	.881
11	**I understand the causes of asthma as a healthcare student.**	5.78 (±1.093)	5.47 (±1.653)	5.75 (±2.500)	.835
12	**I recognize common signs and symptoms of asthma as a healthcare student.**	6.00 (±.707)	5.66 (±1.632)	5.75 (±1.893)	.834
13	**I understand the treatment of asthma as a healthcare student.**	5.56 (±1.424)	5.53 (±1.640)	5.75 (±1.893)	.967
14	**I utilize the Global Initiative for Asthma (GINA) guidelines as a healthcare student.**	4.11 (±2.205)	3.85 (±2.386)	5.00 (±2.828)	.642
15	**I attend continuing education offerings on asthma and asthma management.**	4.67 (±2.179)	3.43 (±2.447)	5.00 (±2.828)	.215

SD: Standard Deviation.
Note: : *p*-value was obtained from ANOVA test.
Means are based on a 7-point Likert-scale in which 1 indicates strongly disagree and 7 indicates strongly agree. Score above 4.5 indicates agreement with the statement

Findings Related to Research Question 3:

The third question asked, "Do experienced students in treating asthma have a higher level of knowledge of asthma guidelines in comparison to less experienced students?" As shown in table 4, the only significant difference was in the understanding of asthma treatment between

students who had clinical experience and those who had no clinical experience with a mean score of 6.04 (±1.261) vs. 5.13 (±1.755) (p=.044). No significant difference was found in the other surveys' statements (See Table 4) (See figure 2). Moreover, there was no correlation between years of experience and the level of knowledge of asthma guidelines.

Table 4: Findings related to research Question 3: Experience in Healthcare and The Level of Asthma Knowledge

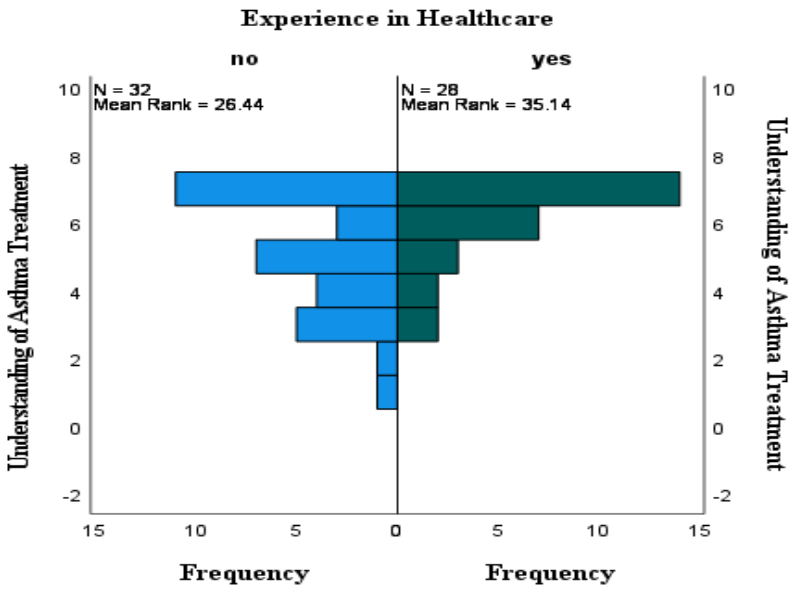
Item No.	Survey Statement	Yes N=28	No N=32	p-value
		Mean (±SD)	Mean (±SD)	
11	I understand the causes of asthma as a healthcare student.	5.96 (±1.232)	5.16 (±1.834)	.113
12	I recognize common signs and symptoms of asthma as a healthcare student.	6.11 (±1.286)	5.38 (±1.661)	.086
13	I understand the treatment of asthma as a healthcare student.	6.04 (±1.261)	5.13 (±1.755)	.044*
14	I utilize the Global Initiative for Asthma (GINA) guidelines as a healthcare student.	4.11 (±2.485)	3.84 (±2.288)	.677
15	I attend continuing education offerings on asthma and asthma management.	3.86 (±2.606)	3.59 (±2.354)	.702

*The significance level is .050.

Note: p-value was obtained from Mann-Whitney U test.

Means are based on a 7-point Likert-scale in which 1 indicates strongly disagree and 7 indicates strongly agree. Score above 4.5 indicates agreement with the statement

Figure 2: Independent-Samples Mann-Whitney U Test



In regards to the experience of treating asthma patients and the level of asthma knowledge among healthcare students, the study showed that students who never treated asthma patients had significantly lower knowledge about the causes of asthma (p=.039), signs and symptoms of asthma (p=.004), as well as the treatment of asthma (p=.005). There was no significant difference in the frequency of treating asthma among healthcare students regarding utilizing Global Initiatives for Asthma Guidelines (GINA) and attending continuing education on asthma management. (See table 5).

Table 5: Findings related to research Question 3: Frequency of Treating Asthma and The Level of Asthma Knowledge

Item No.	Survey Statement	Frequency of Treating Asthma				*p*-value
		Often Mean (±SD)	Sometimes Mean (±SD)	Rarely Mean (±SD)	Never Mean (±SD)	
11	I understand the causes of asthma as a healthcare student.	6.67 (±.577)	6.00 (±1.069)	6.63 (±.518)	5.15 (±1.754)	.039*
12	I recognize common signs and symptoms of asthma as a healthcare student.	7.00 (±.000)	6.63 (±.518)	6.75 (±.463)	5.24 (±1.625)	.004*
13	I understand the treatment of asthma as a healthcare student.	7.00 (±.000)	6.63 (±.518)	6.38 (±.916)	5.07 (±1.679)	.005*
14	I utilize the Global Initiative for Asthma (GINA) guidelines as a healthcare student	5.00 (±3.464)	3.50 (±2.204)	4.00 (±2.673)	3.98 (±2.329)	.836
15	I attend continuing education offerings on asthma and asthma management.	5.00 (±3.464)	2.50 (±2.000)	4.00 (±2.828)	3.80 (±2.400)	.409

*The significance level is .050.
Note: Note: *p*-value was obtained from ANOVA test.
Means are based on a 7-point Likert-scale in which 1 indicates strongly disagree and 7 indicates strongly agree. Score above 4.5 indicates agreement with the statement

Regarding the personal experience of being an asthma patient and the level of asthma knowledge among healthcare students, the findings revealed that students who had been diagnosed with asthma had significantly higher levels of knowledge about the signs and symptoms as well as a better understanding of asthma treatments than non-asthmatic students (p=.005, p=.014, respectively). However, no significant difference was found in the knowledge of causes, utilizing

GINA guidelines, or attending continuing education on asthma among students who self-reported being diagnosed with asthma and those who reported not having asthma. (See table 6).

Table 6: Findings related to research Question 3: Personal Experience of Being an Asthma Patient and The Level of Asthma Knowledge

Item No.	Survey Statement	Yes N=16	No N=44	p-value
		Mean (±SD)	Mean (±SD)	
11	I understand the causes of asthma as a healthcare student.	5.94 (±1.526)	5.39 (±1.646)	.183
12	I recognize common signs and symptoms of asthma as a healthcare student.	6.50 (±1.033)	5.43 (±1.591)	.005*
13	I understand the treatment of asthma as a healthcare student.	6.31 (±1.250)	5.27 (±1.633)	.014*
14	I utilize the Global Initiative for Asthma (GINA) guidelines as a healthcare student.	4.13 (±2.729)	3.91 (±2.250)	.778
15	I attend continuing education offerings on asthma and asthma management.	3.31 (±2.676)	3.86 (±2.388)	.388

*The significance level is .050.
Note: *p*-value was obtained from Mann-Whitney U test.
Means are based on a 7-point Likert-scale in which 1 indicates strongly disagree and 7 indicates strongly agree. Score above 4.5 indicates agreement with the statement

Summary:

Sixty students (N=60) were surveyed from three majors: nursing students accounted for 78.3%; followed by respiratory therapy students 15%; and nutrition students 6.7%. The majority of respondents were female (88.3%), while only seven were male (11.7%). 26.7% of the participants self-declared that they had been diagnosed with asthma. Almost half of the sample had no experience in healthcare (53.3%). Only three participants (5%) were often treating asthma patients while more than half of the participants had never treated asthma patients (68.3%). The findings revealed that healthcare students reported the strongest agreement on the importance of recognizing the signs and symptoms of asthma with a total mean score of 6.85 (SD±.404).

Moreover, Students who had clinical experience demonstrated significantly greater understanding of asthma treatment than those who had no clinical experience (p=.044). The study also showed that students who never treated asthma patients had significantly lower knowledge about the causes of asthma (p=.039), signs and symptoms of asthma (p=.004), and the treatment of asthma (p=.005). Asthmatic students rated their knowledge about the signs and symptoms, and treatment of asthma significantly higher than non-asthmatic students (p=.005, p=.014, respectively).

Chapter V

Interpretations of Findings

The purpose of this chapter is to discuss the findings presented in Chapter VI. The chapter includes six major sections: an overview of the study, discussion of results, implications for research, suggestions for future research, limitations, and conclusion.

Overview of the study

The study aimed to compare the level of asthma knowledge among an interdisciplinary sample of healthcare professional students at Georgia State University. Three questions were used as a guide in this study:

1. What are the perceptions of healthcare professional students toward the evidence-based practices of asthma management?

2. Are Respiratory therapy students more familiar with asthma guidelines than other healthcare professional students?

3. Do experienced students treating asthma have a higher level of knowledge of asthma guidelines than less experienced students?

Discussion

The first question asked, "What are the perceptions of healthcare professional students toward the evidence-based practices of asthma management?" This research question's overall findings revealed that healthcare students had positive perceptions of asthma management's evidence-based practices. This consistent with other studies on the perceptions and attitudes of

pharmacy students toward asthma. Amorha and associates (2018) found that pharmacy students positively respond to asthma's perception and attitude. Moreover, the study revealed that healthcare students have a positive perception of asthma treatments. However, the findings of Urrutia-Pereira and colleagues (2018) reported that college students showed poor acceptance for asthma treatment, with only 33% having good perceptions about asthma treatments. The inconsistent perceptions regarding asthma treatments may be explained by the variety of majors included in the study. Urrutia-Pereira and colleagues (2018) recruited students from five majors: medicine, nursing, physiotherapy, pharmacy, and physical education. However, the current study includes students from three majors: nursing, respiratory therapy, and nutrition.

Moreover, the lowest level of agreement was for continuing education on asthma management, which may be explained by the lack of awareness about the educational programs available on asthma management. Earning Asthma Educator Certification (AE-C) is an approach to advance excellence in asthma education among a wide range of healthcare professionals which provides a convenient option for healthcare students to pursue post-graduation educational plans (Cicutto et al., 2005)

The second question asked, "Are Respiratory therapy students more familiar with asthma guidelines than other healthcare professional students?" There was no significant difference in the familiarity with asthma guidelines between respiratory therapy students and other healthcare students. Only nine respiratory therapy students participated in the study, which provides insufficient power to detect significant effects on familiarity with asthma guidelines and explains the insignificant difference found between respiratory therapy students and other healthcare majors in the study population.

However, the familiarity with asthma guidelines among healthcare students and practitioners differs between studies. Wisnivesky and colleagues (2008) assessed the familiarity and knowledge of asthma guidelines in a sample of nurse practitioners, residents, and internal medicine fellows. They found that only 39% of the participants were generally familiar with the guidelines. Contrary to Adeniyi and associates' (2017) findings that showed that most physicians in Nigeria were aware of the recommendations of GINA guidelines.

Although our study included a limited sample of respiratory therapy students, they showed high levels of knowledge and positive perceptions regarding asthma management. These findings are similar to other results in a study conducted by Sockrider and colleagues (1998) comparing the attitudes and perceptions toward pulmonary disease prevention practices, including asthma, influenza, and smoking cessation among a sample of 164 respiratory therapy students, 190 respiratory therapists, and 5744 medical students. They found that respiratory therapists and students believed that asthma prevention was as crucial as asthma treatment itself. They also had positive perceptions and attitudes toward their role in asthma management when compared to medical students. These findings emphasize that respiratory therapy students and practitioners may be more familiar with managing respiratory conditions than other healthcare professions.

Our study assessed the familiarity at a single educational institution but included a multidisciplinary sample of Healthcare students. However, García-Marcos et al. (2004) compared childhood asthma knowledge levels among first-year nursing students from three different nursing programs in the UK, Spain, and Germany. The researchers concluded that overall understanding of asthma therapeutics was poor among nursing students in the three programs they studied. Nursing students in the UK and Germany had significantly better knowledge of asthma triggers than those in Spain. Moreover, nursing students in the German

program had significantly higher levels of understanding regarding asthma symptoms. The variation in knowledge among nursing students may be attributed to the variety of nursing programs included in the study and the socio-geographical factors related to the programs' locations. Moreover, García-Marcos and associates (2004) explained the significantly higher level of knowledge among UK nursing students by their elevated mean age, which allowed them to learn more about asthma as a life experience. Our findings showed that although the nutrition students had a relatively higher mean age, it did not contribute to significant asthma knowledge differences.

Moreover, our findings that healthcare students, including respiratory therapy, nursing, and nutrition, were already familiar with asthma causes. Contrary to Urrutia-Pereira and colleagues (2018) found that pharmacy and physical education students were significantly less familiar in comparison to the medicine, nursing, and physiotherapy students ($p<.05$). The inconsistency between the two findings is justified by the differences in the disciplines included in each study.

The third question asked, "Do experienced students in treating asthma have a higher level of knowledge of asthma guidelines than less experienced students?" In the context of this study, the experience was investigated using experience in healthcare, experience in treating asthma patients, as well as the personal experience of being an asthmatic patient.

Our findings showed that students who had previous healthcare experience reported a significantly higher endorsement for understanding asthma treatment than students who had no prior experience in healthcare. This may be attributed to the impact of adequate exposure in healthcare settings and the possibility of having access to evidence-based management of asthma in work environments. O'Laughlen et al. (2013) declared that most nurses and physicians, who

reported having access to the guidelines, demonstrated acceptable levels of knowledge regarding asthma management.

This study revealed no association between years of experience and levels of knowledge regarding evidence-based practices of asthma management. This may be because the length of healthcare experience among participants was relatively short of manifesting the impact of gaining knowledge with time (mean± SD = 3.21± 4.2 years). Contrary to the findings of Alshafa & Alshehri's (2020) study that showed that the increase in years of clinical experience positively impacted the knowledge of asthma guidelines among physicians in Saudi Arabia. The results demonstrated that physicians who had more than sixteen years of experience in healthcare scored highest in understanding asthma guidelines than those with less healthcare experience.

Moreover, This study revealed that students who had never treated asthma patients rated their understanding of the causes, signs, symptoms, and asthma treatment significantly lower than those who treated asthma patients more frequently. This finding may be explained by inadequate exposure to asthma cases. It's worth mentioning that students who reported often treating asthma reported a higher endorsement for evidence-based asthma management than students who treated asthma less frequently, reflecting their confidence in the knowledge gained from handling asthma patients. These findings are consistent with other studies' findings. Adeniyi et al. (2017) investigated the understanding of asthma among ninety-six physicians. The study reported that high asthma knowledge levels were observed in physicians with less than ten years of work experience and physicians who treated asthma patients over the last twelve months. Similarly, Wisnivesky and associates (2008) found that physicians who self-rated their asthma expertise as high to moderate were more aware of asthma guidelines and therapeutic recommendations than those with minimal to low asthma expertise.

Our findings showed that students who self-reported having asthma rated their recognition of signs and symptoms and their understanding of asthma treatment significantly higher than non-asthmatic students. This emphasizes the impact of personal experience of having asthma on knowledge of disease management. These findings are compatible with the García-Marcos et al. (2004) study that included nursing students in which ten were asthmatic. They found that asthmatic nursing students demonstrated higher levels of knowledge regarding asthma management than non-asthmatic nursing students.

Implication for Research

The study findings provide an in-depth insight into the perceptions of evidence-based practices regarding asthma management among a sample of healthcare students from different disciplines. The study also adds to the extant literature by assessing the relationship between experience in treating asthma patients and levels of knowledge about asthma management. This study's information may be used to design a targeted intervention to improve understanding of evidence-based management of asthma in college settings. These findings address the need to enhance clinical experience among interdisciplinary healthcare students through asthma simulation sessions, with an emphasis on evidence-based practices and interdisciplinary collaboration to improve both asthma understanding and clinical outcomes. The findings also stress the necessity for informing healthcare students about the available sources for continuing education on asthma such as earning asthma educator certification (AE-C). This study's findings will contribute to future practice-informed research on asthma management.

Suggestion for Future Research

Future research is recommended due to the lack of research that evaluates healthcare students' perceptions of asthma management's evidence-based practices. Replication of the study to include a larger sample size of various healthcare professions and multiple educational institutions is recommended.

Limitations

Several factors were limiting the study. First, the small sample size compared to healthcare students in a southeastern university. The second factor is that including a single educational institution in the study. These factors limited the generalizability of the findings.

Conclusion

Healthcare students have positive perceptions regarding evidence-based practices for asthma management. The study's findings support that respiratory therapy students showed no superiority in familiarity with asthma guidelines over other healthcare students. The study affirms that experience positively impacts the knowledge and orientation of evidence-based practices for asthma management.

APPENDIX A: Survey of the perceptions of healthcare students toward Asthma Management

Survey of the perceptions of healthcare students toward Asthma Management

Please answer each of the following questions by circling the number that best describes your opinion.

To what extent do you agree with each of the following statements?	***Strongly Disagree*** ↔ ***Strongly Agree***						
1. It is important for me to identify the causes of asthma as a healthcare student.	1	2	3	4	5	6	7
2. It is important for me to recognize common signs and symptoms of asthma as a healthcare student.	1	2	3	4	5	6	7
3. It is important for me to understand the treatment of asthma as a healthcare student.	1	2	3	4	5	6	7
4. It is important for me to utilize the Global Initiative for Asthma (GINA) guidelines as a healthcare student.	1	2	3	4	5	6	7
5. It is important for me to attend continuing education offerings on asthma and asthma management.	1	2	3	4	5	6	7
6. My peers believe that I should understand the causes of asthma as a healthcare student.	1	2	3	4	5	6	7
7. My peers believe that I should recognize common signs and symptoms of asthma as a healthcare student.	1	2	3	4	5	6	7
8. My peers believe that I should understand the treatment of asthma as a healthcare student.	1	2	3	4	5	6	7
9. My peers believe that I should utilize the Global Initiative for Asthma (GINA) guidelines as a healthcare student.	1	2	3	4	5	6	7
10. My peers believe that I should attend continuing education offerings on asthma and asthma management.	1	2	3	4	5	6	7
11. I understand the causes of asthma as a healthcare student.	1	2	3	4	5	6	7

12. I recognize common signs and symptoms of asthma as a healthcare student.	1	2	3	4	5	6	7
13. I understand the treatment of asthma as a healthcare student.	1	2	3	4	5	6	7
14. I utilize the Global Initiative for Asthma (GINA) guidelines as a healthcare student.	1	2	3	4	5	6	7
15. I attend continuing education offerings on asthma and asthma management.	1	2	3	4	5	6	7

Part II.

Please answer the following background variables.

16. What is your gender?

O Male **O Female** **O Other**

17. What is your age in years?

18. Have you ever been diagnosed with asthma?

O Yes **O No**

19. How often have you treated asthma patients?

O Often **O Sometimes** **O Rarely** **O Never**

20. Do you have experience in healthcare?

O Yes **O No**

21. If so, how many years of experience do you have?

22. What is your major?

O Nursing	O Respiratory Therapy
O Physical Therapy	O Occupational Therapy
O Nutrition Therapy	O Health Informatics

O Other, please specify _____

Thank you for participating in this survey.

APPENDIX B: Informed Consent

Dear Undergraduate Healthcare Students,

You are invited to participate in a study titled "The Perceptions of Healthcare Students toward the Evidence-Based Practice of Asthma Management". The study will explore the level of asthma knowledge among an interdisciplinary sample of healthcare professional students at Georgia State University.

The research is being conducted by Fatimah Alobaidi, a master's student at Georgia State University, under the direction of Dr. Rachel Culbreth, Assistant Professor in the Department of Respiratory Therapy. Your participation in this study is voluntary and you may refuse to participate at any time. You may submit a blank survey at any time without a penalty. If you are willing to participate in this study, you will be asked to complete the following survey. The survey should take approximately 10 minutes or less to complete. All responses are completely confidential. No names, codes, or IP addresses will be used to identify respondents. The provided information will be solely used for research purposes. All surveys will be deleted after they have been collected.

If you have any questions about the research, please contact Fatimah Alobaidi at falobaidi1@student.gsu.edu or Dr. Rachel Culbreth at rculbreth@gsu.edu. The department's contact information can be found at the bottom of this page. If you are 19 years of age or older and agree to the above, please click on the link below labeled Asthma Knowledge Survey. By completing this survey, you are agreeing to be in the study.

Sincerely,

Fatimah Alobaidi

Department of Respiratory Care

Georgia State University

P.O. Box 4019

Atlanta, GA 30302

(404)413-1270

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