

# A Comparison of Practice Patterns Among Certified and Noncertified Asthma Educators

Jared B Rice and Kathleen M Mathieson

**BACKGROUND:** Asthma educators are essential for providing patients with the knowledge and skills needed to control asthma. The purpose of this descriptive, cross-sectional survey was to examine the differences in practice patterns between certified and noncertified asthma educators. **METHODS:** Subjects ( $N = 98$ ) included certified asthma educators ( $n = 66$ ) and noncertified asthma educators ( $n = 32$ ) who provided asthma education directly to patients and their families. Subjects were asked to complete an asthma task assessment tool, composed of a 31-item Likert scale survey based on the AE-C certification exam content and the National Asthma Education Prevention Program's Expert Panel Report 3 guidelines, which include 6 domains of asthma education (ie, the asthma condition, assessing the patient and family, behavioral and environmental factors, asthma management education, asthma medications, and organizational issues). Subjects identified frequency in performing specific asthma education tasks on a scale from "Always" to "Never." **RESULTS:** Noncertified asthma educators were significantly more likely than certified asthma educators to report performing tasks more frequently than certified asthma educators for item 17: Explain the definition of asthma control and loss of control, and controlled versus not well controlled. The largest difference in reported means between certified and noncertified asthma educators was for item 8: Diagnose asthma, with certified asthma educators reporting higher frequencies. Certified asthma educators reported higher frequency scores on 11 of the 31 tasks. **CONCLUSIONS:** For a majority of the education tasks, certified versus noncertified responses did not differ in their reported frequency of performing education tasks. Future researcher should examine the potential differences in patient outcomes based on provider certification status. *Key words:* asthma; asthma education; asthma educator; AE-C; certified asthma educator; asthma control. [Respir Care 2020;65(7):966–971. © 2020 Daedalus Enterprises]

## Introduction

Asthma is a chronic respiratory disease that affects 17.7 million adults and 6.3 million children in the United

States.<sup>1</sup> Nearly 10.5 million physician office visits and 1.8 million emergency department visits are attributed to asthma annually.<sup>1</sup> Asthma also contributes to nearly \$63 billion annually in health care costs, 10 million missed days of school, 14 million missed days of work, and \$6 million in lost productivity annually.<sup>2</sup> In sum, asthma is a high-cost, high-burden, chronic condition that must be managed by millions of Americans every day.

---

Drs Mathieson and Rice are affiliated with A.T. Still University, Mesa, Arizona.

Dr Rice presented a version of this paper at the 2018 Association of Asthma Educators Conference, July 19-22, 2018, in Phoenix, Arizona.

The authors have disclosed no conflicts of interest.

Correspondence: Jared B Rice DHSc MBA RN RRT RRT-NPS RRT-ACCS RPFT AE-C, A.T. Still University, 5850 E. Still Circle, Mesa, AZ 85206. E-mail: jared\_rice77@yahoo.com.

The keystone for helping people with asthma control their disease is asthma self-management education. Asthma self-management education is an effective strategy for helping people with asthma control their disease and prevent exacerbations.<sup>3</sup> Basic elements of asthma self-management education include assessing what the patient knows about asthma, identifying individual triggers, defining a patient's goals and preference for treatment, and assessing patient preferences for decision-making and their ability to self-

DOI: 10.4187/respcare.06600

manage.<sup>4</sup> Asthma self-management education helps patients gain an understanding of what asthma control is and how to treat loss of control quickly and effectively, and when to seek medical attention.

Asthma education can be considered a distinct health care discipline that has evolved since its inception as a discipline in 2002.<sup>6</sup> As asthma care continues to develop, it is only natural for the role of the asthma educator to change as well. Various health care professionals can become asthma educators, and such educators can be found in a variety of settings providing asthma education to patients and their families. However, evidence suggests that specialty certification can improve the quality of education provided.<sup>7</sup> In the early 2000s, the National Asthma Educator Certification Board (NAECB) offered candidates the first opportunity to sit for the Asthma Educator Certificate (AE-C) Exam.<sup>8</sup> Providers who demonstrate strong knowledge and experience in asthma education, as demonstrated by (1) providing direct asthma education, counseling, or coordinating services with a minimum of 1,000 h or (2) being licensed or credentialed as a physician, physician assistant, nurse, respiratory therapist, pulmonary function technologist, pharmacist, social worker, health educator, physical therapist, or occupational therapist, are eligible to test for certification.<sup>8</sup>

The National Asthma Education Prevention Program's Expert Panel Report 3 outlined the current best-evidence practice for the diagnosis and treatment of asthma.<sup>5</sup> A major focus of the National Asthma Education Prevention Program's guidelines is recommendations for best practices in asthma education, including teaching patients how to assess and monitor their asthma symptoms and providing education about asthma self-management, control of environmental exposures that affect asthma, and medications to treat asthma. These guidelines were established to ensure that patients with asthma receive education and treatment based on what research has shown to be the best practice.

### Job Responsibilities of Asthma Educators

Research into the job responsibilities for asthma education is limited. Cataletto et al<sup>9</sup> surveyed asthma educators who were renewing the AE-C credential to evaluate how the asthma educators were utilized. When asked to identify their work responsibilities, the most frequently reported responsibilities were discussing asthma action plans, creating asthma action plans for adults, and developing asthma programs and asthma action plans.<sup>9</sup>

Another study investigated the practice patterns of pharmacists who provide asthma education. Hudd et al<sup>10</sup> surveyed pharmacists who were also certified asthma educators to inquire about types of asthma services provided, clinical activities related to asthma, and if they were re-

### QUICK LOOK

#### Current knowledge

Asthma self-management education is central to helping people with asthma control their chronic condition. Asthma education is provided by numerous health care professionals in a variety of settings. An asthma educator may or may not hold a credential in asthma education.

#### What this paper contributes to our knowledge

Our results suggest there is little difference among the practice patterns of certified asthma educators and non-certified asthma educators. Holding the Asthma Educator Certificate certification did not expand the role or responsibility for the provider.

imbursed for time spent providing asthma services. The most commonly reported responsibilities were disease-state education, device technique counseling, monitoring response to therapy, selecting dosage and device formulations, assessing a patient's level of control, completing asthma action plans, and providing education about asthma action plans.<sup>10</sup> However, the research focused on pharmacists who certified asthma educators (ie, AE-), not the total population of health professionals who are asthma educators.

There is a significant gap in the research about the actual asthma education tasks being performed by certified and noncertified asthma educators. Therefore, the purpose of this study was to identify differences in practice patterns based on holding the AE-C credential.

### Methods

#### Study Setting and Study Participants

This descriptive, cross-sectional survey utilized convenience sampling for recruitment. Subjects were eligible to complete the electronic survey if they were a health care professional in the United States who provides asthma education to patients and families as part of their regular job responsibilities. Thus, subjects came from a variety of professions, including physicians, physician assistants, nurses, respiratory therapists, pulmonary function technologists, pharmacists, social workers, health educators, physical therapists, and occupational therapists. Because certification as an asthma educator is not required for providing asthma education, participants were included regardless of whether they held the AE-C credential.

Health care professionals who did not provide asthma education directly to patients or their families in their cur-

rent role were excluded from this study. This included health care professionals in academic positions and those in managerial or supervisory roles.

The electronic survey was posted on social media sites and distributed to list server of the Association of Asthma Educators. Before starting the survey, subjects were asked to provide consent to participate by checking a box stating that they understood the risks and benefits of participation. This survey was approved by the institutional review board at A.T. Still University. Participation in the survey was anonymous, and no personal identifiers were used in the survey.

**Survey Development**

The survey instrument was self-designed based on the National Asthma Educator Certification Board (NAECB) content outline for the AE-C examination, which listed 4 areas of asthma education, and the National Asthma Education and Prevention Program *Guidelines for the Diagnosis and Management of Asthma*, which outlined 4 components of asthma education. After reviewing the previously mentioned resources, similar domains of asthma education were combined resulting in 6 domains: the asthma condition, assessing the patient and family, behavioral and environmental factors, asthma management education, asthma medications, and organizational issues.

The first draft of the survey had 34 items and was reviewed by a multidisciplinary panel of former and current members of the board of directors of the Association of Asthma Educators to establish face validity. Seven asthma education experts participated in the review. To establish content validity, Aiken’s V content-validity coefficient was applied to each variable after review.<sup>11</sup> Items with a coefficient of < 0.75 were excluded. The final draft of the survey had 31 items. Subjects were asked to identify how frequently they performed each of the questions when providing asthma education. Responses were measured on a 5-point Likert scale with responses ranging from “Always” to “Never.” The survey was administered via SurveyMonkey.

**Data Analysis**

Data were downloaded from SurveyMonkey into SPSS Statistics Grad Pack 24.0 (IBM, Armonk, New York) for data analyses. Descriptive and summary statistics were calculated for all variables. Ordinal variables included the practice patterns of asthma education, which were measured with a Likert scale with frequency responses of Always (1), Often (2), Sometimes (3), Rarely (4), and Never (5). Ordinal variables were checked for normality using the Kolmogorov-Smirnov test ( $P < .05$ ) and determined to be non-normal. Therefore, nonparametric statistical tests

Table 1. Demographic Characteristic of Survey Respondents

Characteristic	Frequency, n (%)
<b>Profession</b>	
Respiratory therapist	43 (43.9)
Nurse	39 (39.8)
Physician	3 (3.1)
Pulmonary function technologist	2 (2.0)
Pharmacist	2 (2.0)
Physician assistant	1 (1.0)
Social worker	1 (1.0)
Health educator	1 (1.0)
Physical therapist	1 (1.0)
Other	5 (5.1)
<b>Geographical region</b>	
Southeastern	39 (39.8)
Midwestern	25 (25.5)
Northeastern	22 (24.4)
Western	12 (12.2)
<b>Asthma educator certification (AE-C)</b>	
Yes	66 (67.3)
No	32 (32.7)

*N* = 98 survey respondents

were used for all data analyses. Missing data were identified and excluded on each respective analysis.

The Mann-Whitney *U* test and Kruskal-Wallis analysis of variance was conducted. Significant Kruskal-Wallis tests were followed with post hoc Mann-Whitney *U* tests to evaluate pairwise differences between the groups. Alpha was set to 0.05, 2-tailed for all analyses except post hoc comparisons.

**Results**

After the survey was distributed, 108 participants opened the link to the survey; 98 participants began the survey, and 92 completed the survey. Ten participants were excluded because they indicated that they did not provide direct asthma education to patients or their families. Self-reported demographic characteristics are reported. The largest professional group that responded were respiratory therapists ( $n = 43, 43.9%$ ), followed by nursing ( $n = 39, 39.8%$ ). The largest self-reported geographical location in the United States was Southeastern ( $n = 39, 39.8%$ ), followed by Midwestern ( $n = 25, 25.5%$ ). Sixty-six (67.3%) subjects reported that they held the AE-C credential, whereas 32 (32.7%) did not hold the credential (Table 1).

Certified asthma educators were found to report higher frequency scores on 11 of the 31 variables. There was no difference between certified asthma educators and noncertified asthma educators for 18 of the 31 variables. Non-

PRACTICE PATTERNS OF ASTHMA EDUCATORS

Table 2. Practice Patterns for AE-Cs Versus Noncertified Asthma Educators

Variable	AE-Cs	Noncertified Asthma Educators	P
1. Explain normal lung anatomy and physiology and the alterations that characterize asthma.	1 (1/3)	2 (1/4)	.003
2. Explain the terms used to characterize asthma (eg, inflammation, bronchospasm, hypersensitive airways).	1 (1/4)	1.5 (1/4)	.14
3. Explain the process that occurs in the lungs during an asthma exacerbation.	1 (1/3)	1 (1/3)	.02
4. Obtain patient and family history.	1 (1/5)	1 (1/5)	.02
5. Perform physical assessment focused on asthma (eg, breath sounds, oxygen saturation, cough, wheeze, shortness of breath, chest tightness).	1 (1/5)	1 (1/5)	.85
6. Obtain objective measures of lung function (eg, peak flow, pulmonary function testing).	2 (1/5)	3 (1/5)	.001
7. Interpret spirometry results.	2 (1/5)	3.5 (1/5)	.002
8. Diagnose asthma.	2 (1/5)	5 (1/5)	.02
9. Perform or interpret the results of bronchial challenge (ie, exercise or inhaled agent such as methacholine).	5 (1/5)	5 (2/5)	.13
10. Assess for coverage of symptoms (eg cough, wheeze, shortness of breath, chest tightness), patterns (eg, nighttime, exercise, work, exposure), and use of quick relief inhalers for relief.	1 (1/5)	1 (1/4)	.02
11. Help the patient identify factors that contribute to chronic and acute asthma like identifying triggers.	1 (1/3)	1 (1/5)	.01
12. Address smoking cessation.	1 (1/4)	1 (1/3)	.61
13. Assess adherence to asthma management or action plan.	1 (1/3)	1 (1/5)	.17
14. Identify patient and family support systems.	1 (1/4)	1 (1/4)	.63
15. Assess psychosocial issues that may affect asthma self-management.	1 (1/4)	1.5 (1/5)	.22
16. Explain the role of allergens and irritants in asthma.	1 (1/3)	1 (1/4)	.16
17. Explain the definition of asthma control and loss of control, and controlled versus not well controlled.	4 (1/4)	2 (1/5)	.041
18. Develop, provide, explain, and/or recommend changes to a patient's asthma action plan.	1 (1/5)	2.5 (1/5)	.001
19. Encourage adherence to the patient's asthma action plan.	1 (1/3)	1 (1/5)	.002
20. Identify when the patient should seek medical attention.	1 (1/2)	1 (1/4)	.001
21. Assess for barriers to adherence with asthma action plan.	1 (1/3)	2 (1/5)	.003
22. Explain the general mechanisms and role in asthma management of quick relief medications.	1 (1/3)	1 (1/3)	.050
23. Explain the general mechanisms and role in asthma management of long-term control relief medications.	1 (1/2)	1 (1/4)	.049
24. Demonstrate proper use of delivery device for inhaled medication.	1 (1/3)	1 (1/3)	.067
25. Evaluate a patient's ability to properly self-administer inhaled medication.	1 (1/3)	1 (1/5)	.003
26. Dispel misconceptions about asthma medication.	1 (1/4)	2 (1/4)	.02
27. Identify complementary and alternative medications that a patient may be using.	2 (1/5)	2 (1/4)	.61
28. Follow the stepwise approach for asthma medication management.	1 (1/4)	2 (1/5)	.001
29. Develop asthma education programs by performing needs assessment, program planning, program implementing, and evaluating for effectiveness.	2 (1/5)	2 (1/5)	.031
30. Refer a patient to an asthma specialist if needed.	2.5 (1/5)	2 (1/5)	.66
31. Provide, coordinate, or arrange asthma services.	2 (1/5)	2.5 (1/5)	.14

Values are presented as mean (min/max). Mann-Whitney P values are reported. AE-C = certified asthma educator

certified asthma educators reported higher frequencies than certified asthma educators for variable 17: Explain the definition of asthma control and loss of control, and controlled versus not well controlled ( $P = .041$ ); and for variable 30: Refer a patient to an asthma specialist if needed ( $P = .66$ ). The largest difference in reported means between certified and noncertified asthma educators was for variable 8: Diagnose asthma ( $P = .02$ ). The least frequently reported variable for both groups was variable 9: Perform or interpret the results of bronchial challenge (ie,

exercise or inhaled agents such as methacholine) ( $P = .13$ ) (Table 2).

Geographical comparison found little difference in the practice patterns of certified and noncertified asthma educators. Results indicate a statistically significant difference for variable 11: Help the patient identify factors that contribute to chronic and acute asthma like identifying triggers ( $P = .01$ ). Post hoc comparison using Bonferroni correction indicated a difference between Southeastern and Midwestern, between Northeastern and Midwestern, be-

tween Northeastern and Southeastern, and between Midwestern and Western. Western was found to have the lowest mean (1.17), whereas Midwestern had the highest (1.79). No statistical difference was found in any of the other variables.

### Discussion

Research focusing on the practice patterns of asthma educators is limited. The intent of this study was to identify differences in practice patterns based on holding the AE-C credential. This study was not intended to examine patient outcomes based on which group provided asthma education; however, future research should be conducted that focuses on patient outcomes and whether advanced credentialing adds value. The distribution of professions indicated that most AE-Cs were respiratory therapists, followed by nurses, which is consistent with findings reported by Cataletto et al.<sup>9</sup> While asthma education is interdisciplinary, respiratory therapists have often been considered asthma specialists due to their focus on the respiratory system. Nurses, pharmacists, and physician assistants also may provide asthma education.

The groups were disproportionate in size (AE-C = 66 subjects, non-AE-C = 32 subjects), with respiratory therapists being highly represented, followed by nursing. Certified asthma educators, expectedly, scored more frequently on 11 variables, equally on 18 variables, and less frequently on 2 variables. As expected, noncertified asthma educators more frequently made referrals to asthma specialists when needed, but these subjects also reported more frequently explaining the definitions of asthma control. These results indicate that a majority of asthma education practice patterns are not different based on specialized certification in asthma education. However, more noncertified asthma educators reported that they more frequently refer patients to asthma specialists when needed.

The bronchial challenge is useful for detecting airway reactivity, but most participants reported that they never performed a bronchial challenge. Underreporting of the bronchial challenge may be due to numerous reasons. The bronchial challenge study is often performed in the pulmonary function laboratory. Subjects were not asked to identify their primary area of practice, but 2 participants identified as being pulmonary function technologists who may work primarily in the pulmonary function laboratory; thus, the pulmonary function laboratory may be underrepresented in this study.

Asthma education often is deferred to whomever is available instead of who is certified. Ideally, efforts should be made for the best-qualified provider to perform asthma education, but realistically it may be performed by the person who has the best availability.

### Limitations

The primary limitation of this study was related to the overrepresentation of respiratory therapists, which is likely due to the recruitment strategy, which utilized members of a specialty group and an interested social media group, which may make the findings applicable only to those interested in asthma, not the larger population. The study is also limited by the use of convenience sampling, which increases the risk for selection bias and relies on participant truthfulness. Finally, while regions of the United States are represented, some individual states had no participation, which limits the findings to those areas.

### Recommendations for Future Research

Recommendations for future research are to investigate the practice patterns of asthma education while controlling for demographic differences such as profession or state. Future research could also investigate if earning the AE-C credential expands the services that an asthma educator may provide or allows the provider to perform more complex patient care tasks. Research is also needed to compare outcomes for patients who receive asthma education from certified asthma educators versus noncertified asthma educators. Although this study examined who was providing asthma education and their tasks, it does not evaluate performance or patient outcomes. Finally, research should examine how earning the AE-C affects the ability of a provider to bill for services.

### Conclusions

Asthma self-management education is a vital element in the treatment of asthma. The discipline of asthma education continues to evolve. Health care facilities need to consider these findings when they develop or update their asthma education programs and compensations strategies for continuing certification. There is a lack of connection between the AE-C credential and an expansion of skills and responsibilities of providers. Health care facilities should have a clear understanding of the role of the asthma educator and the potential value a certified educator may bring in a supportive setting.

### REFERENCES

1. Centers for Disease Control and Prevention. National health statistics: asthma. Available at: <http://www.cdc.gov/nchs/fastats/asthma.htm>. Accessed October 1, 2017.
2. American Lung Association. Asthma guidelines-based care initiative: benchmarks for key aspects of optimal coverage, 2015. Available at: <https://lung.org/assets/documents/asthma/NAEPP-Guidelines-Factsheet.pdf>. Accessed October 1, 2017.

## PRACTICE PATTERNS OF ASTHMA EDUCATORS

3. Hsu J, Wilhelm N, Lewis L, Herman E. Economic evidence for US asthma self-management education and home-based interventions. *J Allergy Clin Immunol Pract* 2016;4(6):1123-1134.
4. Andrews K, Jones S, Mullan J. Asthma self management in adults: a review of current literature. *Collegian* 2014;21(1):33-41.
5. National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program. Expert Panel Report 3: guidelines for the diagnosis and management of asthma, 2007. Available at: <http://www.nhlbi.nih.gov/guidelines/asthma/asthdln.pdf>. Accessed October 1, 2017.
6. Cataletto M. Commentary: the importance of certified asthma educators in promoting health literacy for children with asthma and their families. *Pediatr Allergy Immunol Pulmonol* 2011;24(3):127-128.
7. Wade CH. Perceived effects of specialty nurse certification: a review of the literature. *AORN J* 2009;89(1):183-192.
8. National Asthma Education Certification Board. Certified asthma educator (AE-C) candidate handbook. Available at: <http://naecb.com/pdf/NAECBhandbook.pdf>. Accessed October 1, 2017.
9. Cataletto M, Abramson S, Meyerson K, Arney T, Bollmeier S, Dennis R, et al. The certified asthma educator: the United States experience. *Pediatr Allergy Immunol Pulmonol* 2011;24(3):159-163.
10. Hudd TR, Bollmeier SG, Seoane-Vazquez E. Survey of certified asthma educator (AE-C) pharmacists—who are they and how is this credential being used? *J Pulm Resp Med* 2014;4(6):1-7.
11. Lewis RA. Content validity and reliability of single items or questionnaires. *Educ Psychol Meas* 1980;40(4):955-959.