Self-efficacy, Barriers, and Opportunities: Examining the Delivery of Asthma Education Among U.S. Primary Care Physician Assistants

Quanté Greenlee, PhD, MPH, PA-C, RRT, CPH, CHES®

BE BOUNDLESS

Introduction

- Few studies on the delivery of asthma education among primary care clinicians (PCCs) have included physician assistants (PAs).
- Data has shown PAs to be an integral part of primary care, most researchers have focused on physicians or nurse practitioners (NPs). [1,2]
- Despite the importance of asthma education in reducing exacerbations and mortality among patients, it is not consistently available in a clinical setting. [3,4,5]

Purpose of the Study

- **The purpose of this study is to determine the factors associated with the delivery of asthma education by primary care PAs.**

- **Previous studies of asthma education delivery among clinicians have focused primarily on physicians, with a paucity of research on PAs and asthma education.**

Importance of the Study

- **This study identified what PA practice characteristics are associated with adherence to component 2 (asthma education) of the NAEPP EPR-3 guidelines.**

- **In addition to assessing adherence to the guidelines this study specified which areas of component 2 were delivered by PAs and associated barriers.**

Research Questions

- **Research Question 1: What characteristics of PA practice are associated with the delivery of asthma education?**
- **Research Question 2: How does clinical experience impact asthma education self-efficacy?**

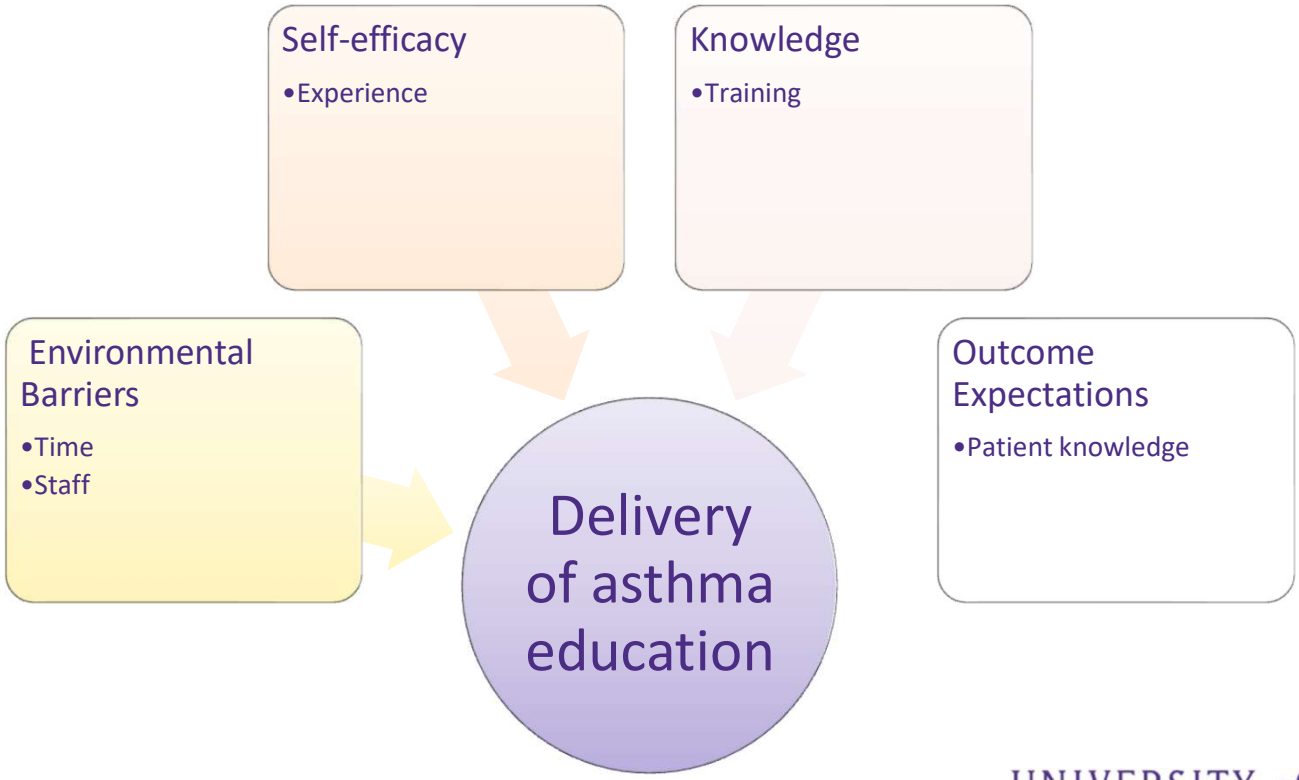
Social Cognitive Theory (SCT)

- Personal cognitive and environmental factors have been researched to evaluate health care practices.[6,7,8]
- Specific constructs researched in these studies include
  - Knowledge
  - Self-efficacy
  - Outcome expectations
  - Barriers

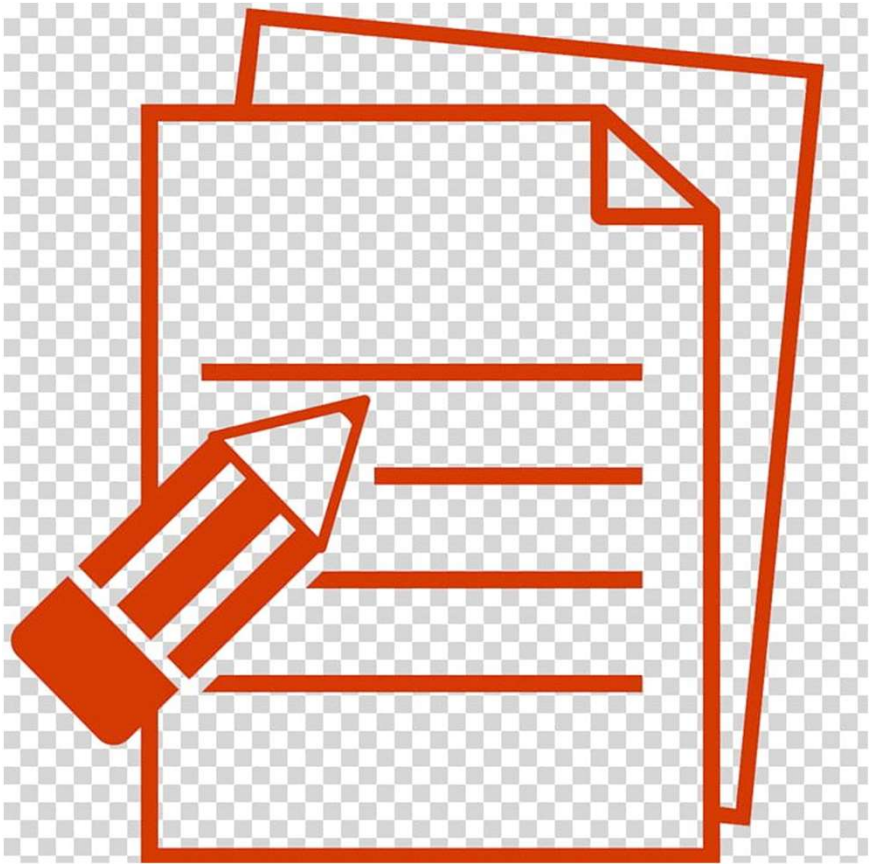
Social Cognitive Theory

- Bandura (2004) proposed that social cognitive learning theory (SCT) is grounded in reciprocal determinism.[9]
- Reciprocal determinism comprises several factors
  - personal cognitive
  - physical and social environment
  - behavioral constructs
- Reciprocal determinism posits that the adoption of health behaviors is due to a dynamic relationship of all three factors.

Theoretical Framework



Review of the Literature



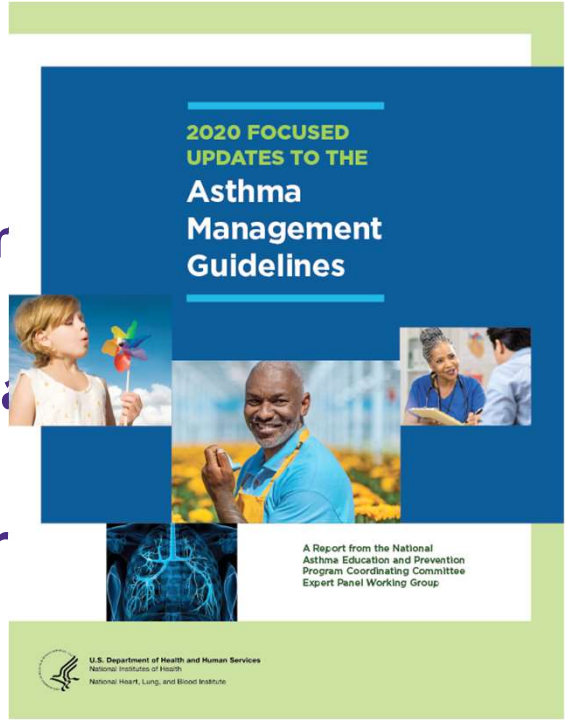
UNIVERSITY of WASHINGTON

Asthma Education

UNIVERSITY of WASHINGTON

National Asthma Education and Prevention Program Expert Panel 3 Guidelines (NAEPP EPR-3)

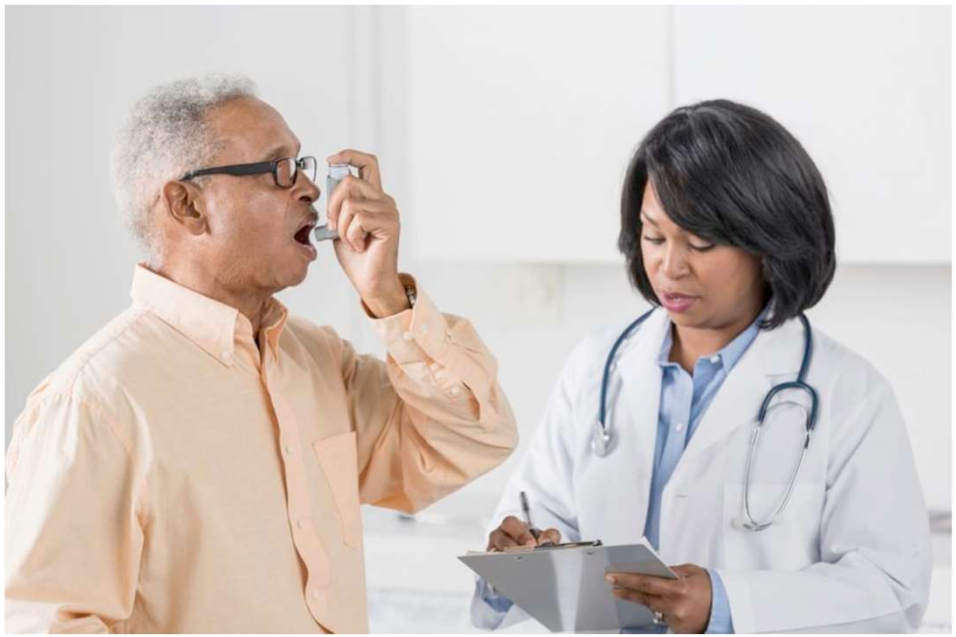
- Component 1
  - Assessing and Monitoring Asthm
- Component 2
  - Education for a Partnership in Ca
- Component 3
  - Control of Environmental Factor
- Component 4
  - Medications



Education for a Partnership in Care

- **Component 2 (NAEPP, 2012)[9]**
  - **Emphasizes asthma self-management as a foundation for patients to develop the knowledge and skills to control their disease.**
- **Asthma education includes:**
  - **Review of the disease process**
  - **Recognition and avoidance of asthma triggers**
  - **Indications of asthma control**
  - **Role of Medications**
  - **Instruction on inhaler and spacer use**
  - **Assessing for proper inhaler and spacer technique**
  - **Peak flow for self-monitoring**
  - **Management of an asthma attack or exacerbation**
  - **When and where to seek treatment**

Clinicians and Asthma Education



Clinicians and Asthma Instruction

- Pediatricians and advanced practice providers (e.g., PAs and APRNs) delivered the most asthma education compared to internists and family medicine physicians.[10]
- Pediatricians and advanced practice providers delivered more than double the AAPs as compared to internists and family medicine physicians.[10]
- Clinicians identified barriers to asthma education delivery as time and knowledge of the EPR-3 guidelines.[11,12]
- 47% of respondents reported having enough staff required to adequately provide asthma education.[13]
- Clinicians have identified the need for additional training on health and asthma ed[illegible]n.[13,14,15]


Methodology

Participants and Sampling

- **Participants**
  - **Full or part-time primary care PAs in the U.S.**
- **Sampling**
  - **Convenience and snowball sampling**
  - **Target sample size n = 231**
  - **Actual sample n = 140**
    - **Post hoc power analysis demonstrated adequate power of .80 and an alpha of .05**
- **Recruitment**
  - **Participants were recruited nationally via LinkedIn, PA groups on Facebook, American Academy of Physician Assistants (AAPA) online community groups, Physician Assistant Education Association (PAEA) online community gro[illegible]an word of mouth.**

Instrumentation

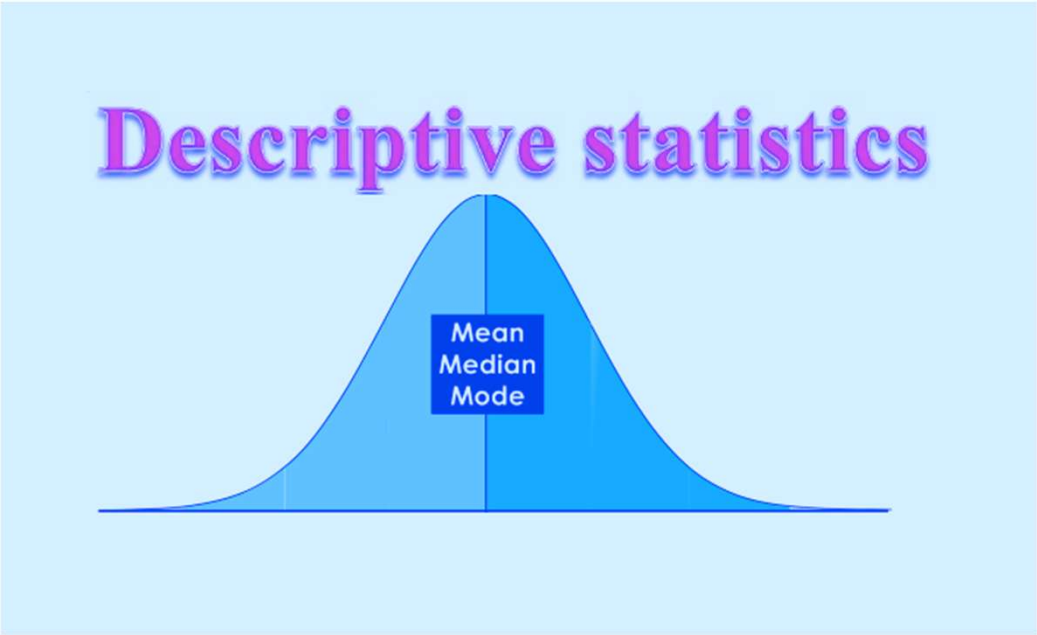
- **NAMCS 2012 National Asthma Survey of Physicians (NAS)**
  - **11-item tool (modified for this study, original version 14 items)**
    - **Clinician demographics**
    - **Clinic characteristics**
    - **Component 2**
      - **Education for a Partnership in Care**
- **Measurements (NAEPP EPR-3 Guidelines)**
  - **Adherence**
  - **Self-efficacy**
  - **Perceived patient knowledge**

Instrumentation

- **Addressing Reliability and Validity**
- **Expert review**
  - A primary care PA, a certified asthma educator, and an expert in questionnaire design assessed content, phrasing, question structure, order of questions, and typographical errors.
  - Modifications to the survey included adding a question regarding asthma education resources.
  - Expanded options for ethnicity/race on demographic questionnaire.
  - Moving personal demographics questions to the end of survey to increase survey completion.
- **Pretesting**
  - 15 primary care PAs pretested the survey prior to to dissemination.
  - Participants did not identify any issues and no modifications were required.
- **Reliability**
  - Cronbach's alpha showed an acceptable internal consistency for asthma education self-efficacy ($\alpha = .86$).
  - No other Likert questions on the survey aligned with the criteria for additional analysis.

Results

Descriptive Statistics



Personal Demographics: Ethnicity/Race

Personal demographics	n	%
Ethnicity/race		
Black or African	9	6.4
White or Caucasian	94	67.1
Asian	15	10.7
Hispanic, Latinx, or Spanish origin	6	4.3
Middle Eastern or North African	1	0.7
Native American or Alaska Native	1	0.7
Native Hawaiian or Other Pacific Islander	1	0.7
Biracial or Multiracial	8	5.7
Other	5	3.6

Personal Demographics: Gender and Age

Personal demographics	n	%
Gender		
Female	110	78.6
Male	30	21.4
Age		
20–34 years	56	40.0
35–44 years	47	33.6
45–54 years	23	16.4
55–64 years	11	7.9
65 and older	3	2.1

Physician Assistant Practice Characteristics: Clinical Demographics

PA practice characteristics: Clinical demographics	n	%
Primary care discipline		
Internal medicine	25	17.9
Family medicine	109	77.9
Pediatrics	4	2.9
Geriatrics	2	1.4
Clinic location		
Rural	40	28.6
Urban	44	31.4
Suburban	56	40.0

Physician Assistant Practice Characteristics: Clinical Experience

PA clinical experience	Mean	SD	Min	Max
Asthma patients seen weekly	10.74	11.36	1	70
Time spent with patient	16.46	6.96	3	45
Years of work experience	9.49	9.31	0	43

Patient age groups treated	Total	
	N	%
0–11 years	80	15.0
12–17 years	88	16.5
18–24 years	118	22.1
25–64 years	131	24.6
65 years and above	116	21.8

Physician Assistant Practice Characteristics: Asthma Education Resources

Asthma education resources	n	%
Clinicians	37	80.4
Nurses	9	19.6
Medical assistants	1	0.7
Pharmacists	1	0.7
Certified asthma educators	2	1.4
Health educators	1	0.7
Videos	1	0.7
Handouts	2	1.4

Frequency of Asthma Action Plan Use and Barriers to Delivery

Asthma action plan use and barriers	n	%
Asthma action plan		
Yes	74	52.9
No	66	47.1
Barriers		
No barrier	5	7.6
Not effective	1	1.5
Poor patient adherence	8	12.1
Low patient health literacy	4	6.1
Lack of staff/equipment	4	6.1
Lack of training	5	7.6
Lack of time	37	56.1
Lack of payment	2	3.0

Frequency of Risk Factor Avoidance Education and Barriers to Delivery

Risk factor avoidance education and barriers	n	%
Risk factor avoidance education		
Yes	138	98.6
No	2	1.4
Barriers		
Poor patient adherence	1	50.0
Lack of time	1	50.0

Frequency of Home/Work Environment Education and Barriers to Delivery

Home/work environment education and barriers	n	%
Environmental education		
Yes	106	75.7
No	34	24.3
No barrier	2	5.9
Not effective	3	8.8
Poor patient adherence	18	52.9
Low patient health literacy	3	8.8
Lack of training	2	5.9
Lack of time	5	14.7
Lack of payment	1	2.9

Frequency of Observing Inhaler Technique and Barriers to Delivery

Observing inhaler technique and barriers	n	%
Observing inhaler technique		
Yes	52	37.1
No	88	62.9
Barriers		
No barrier	11	12.5
Not effective	1	1.1
Poor patient adherence	4	4.5
Low patient health literacy	1	1.1
Lack of staff/equipment	26	29.5
Lack of training	3	3.4
Lack of time	41	46.6
Lack of payment	1	1.1

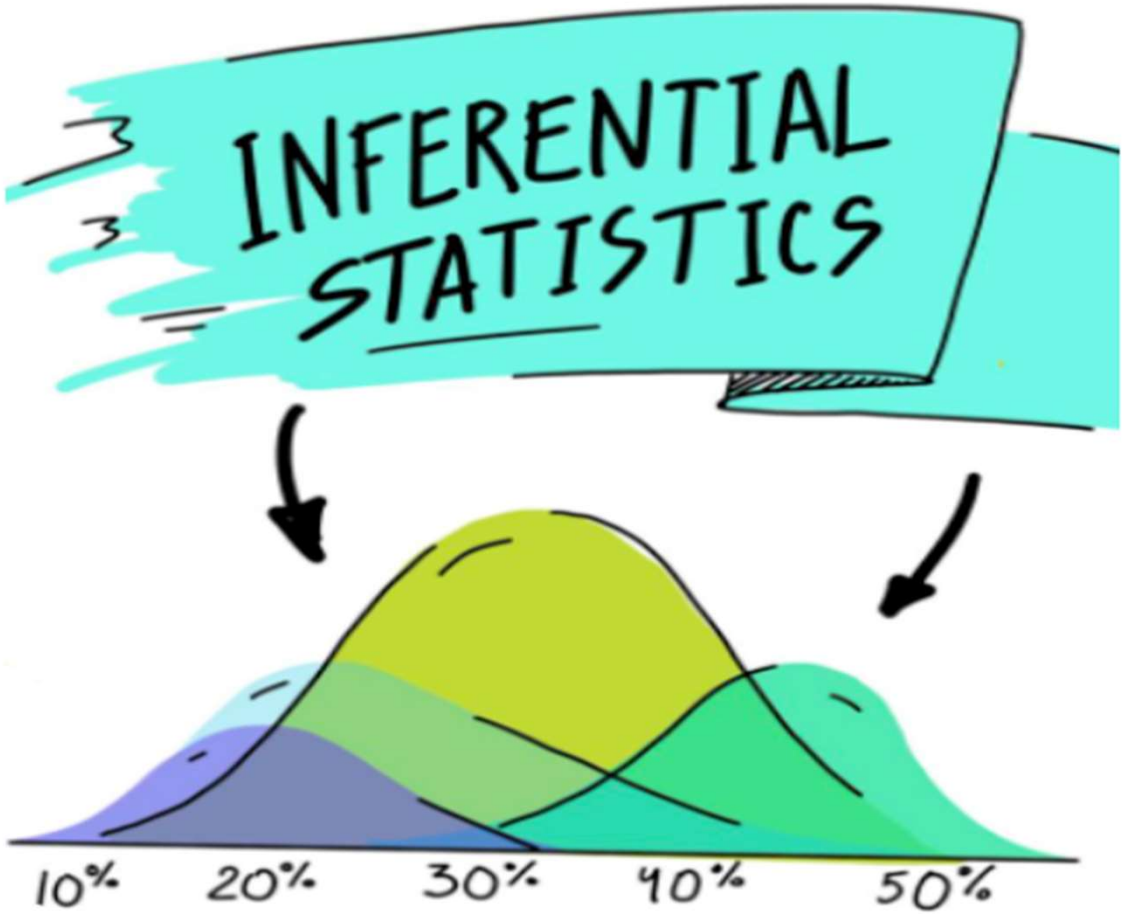
Frequency of Symptom Recognition Education and Barriers to Delivery

System recognition education and barriers	n	%
Symptom recognition education		
Yes	136	97.1
No	4	2.9
Barriers		
Lack of training	1	25.0
Lack of time	3	75.0

Asthma Education Self-Efficacy

Asthma education self-efficacy	n	%
Completing and explaining an AAP		
Very confident	52	37.1
Educating patients on their asthma triggers		
Very confident	72	51.4
Demonstrating proper inhaler technique		
Very confident	63	45.0
Demonstrating proper spacer technique		
Very confident	55	39.3
Educating patients on peak flows		
Very confident	34	24.3
Educating patients about their medications		
Very confident	84	60.0

Results



Research Question 1

- **What characteristics of PA practice are associated with the delivery of asthma education?**

Multiple Regression Analysis for Physician Assistant Characteristics and Personal Demographics Predicting the Delivery of Asthma Education

Predictor	Unstandardized		Standardized	t	p
	b	SE	ß		
Urban	-.07	.19	-.03	-.36	.72
Rural	-.02	.20	-.01	-.11	.92
Internal medicine	.09	.21	-.04	.43	.67
Pediatrics	.39	.48	.07	.82	.41
Geriatrics	-.04	.67	-.01	-.06	.95
Years of working experience	.02	.01	.16	1.43	015
Time spent with patients	.03	.01	.19	2.27	.025*
Gender	-.61	.20	-.26	-3.09	.002**
Ethnicity/race	-.18	.18	-.08	-.98	.33
Age	-.16	.24	-.07	-068	.50

Note. $F(10, 129) = 2.81$, $p < .01$, $R^2 = .18$, adjusted $R^2 = .12$; *$p < .05$, **$p < .01$.

Research Question 2

- **How does clinical experience impact asthma education self-efficacy?**

Multiple Regression Analysis for Clinical Experience and Personal Demographics Predicting Asthma Education Self-Efficacy

Predictor	Unstandardized		Standardized	t	p
	b	SE	ß		
Years of working experience	.10	0.06	.20	1.75	.08
Patients with asthma seen weekly	.01	0.04	.19	.18	.86
Gender	-1.36	0.98	.02	-1.34	.18
Ethnicity/race	-1.22	0.88	-.11	-1.40	.17
Age	-.90	1.19	-.08	-.76	.45

Note. $F(5, 134) = 2.77$, $p < .02$, $R^2 = .09$, adjusted $R^2 = .06$.

Discussion and Conclusion

Physician Assistant Practice Implications

- Like other PCCs, PAs largely do not adhere to EPR-3 Component 2.
- Inhaler use and peak flow meters were the least-frequently delivered education components.
- The low rates of inhaler education could have resulted from low self-efficacy. This study found that only 45% of participants felt very confident demonstrating proper inhaler technique.
- The participants also reported low self-efficacy for demonstrating proper spacer technique (39.3%) and peak flows measurement (24.3%).
- These findings indicate that PAs likely received little training on inhaler technique, spacer technique, or peak flow measurements.
- Additionally, although PCCs commonly complete and explain AAPs, only 37.1% of this study's participants felt very confident performing this task.
- The low self-efficacy with AAPs could indicate deficiencies in PA training. Addressing these deficiencies in the PA program curriculum or clinical training could be a way to improve asthma education delivery.

Study Limitations

- This study's limitations are possible recall and social desirability bias, which could have occurred among the clinicians when reporting practice behaviors. Due to these biases, the participants could have overreported their asthma education delivery.

- This study had a convenience sample found via snowballing, and social media was a major recruitment source. Although the recruitment primarily occurred via PA groups and professional community boards, noneligible PAs could still have taken the survey.

- This study also occurred during the COVID-19 pandemic, and PAs are frontline health care workers. The pandemic resulted in a smaller sample than desired.

- COVID-19 has affected multiple health care levels and caused many PCCs to increase their use of telemedicine.[16] There is no way to determine how telemedicine constraints impacted asthma education delivery. However, researchers found that physicians reported increased patient education with telemedicine.[17]

Recommendations

- **Future Research**
  - **This research did not address when, where, and how PAs learn about asthma education. Further research is needed to evaluate PA training on asthma education.**
  - **Future research could include PA educators and focus on the asthma education components in the program curriculum.**
- **Physician Assistant Practice**
  - **Although the participating PAs did not significantly underperform compared to other PCCs, the results indicate that PAs should use additional resources.**
  - **Mitigating the effect of time on asthma education delivery could include PAs identifying community resources for patient referral.**
  - **Additionally, health educators who provide asthma education to patients and clinicians could address the deficiencies found in this study.**

References

1. Agency for Healthcare Research and Quality. (2018, July 1). *The distribution of the U.S. primary care workforce*. https://www.ahrq.gov/research/findings/factsheets/primary/pcwork3/index.html
2. Najmabadi, S., Honda, T. J., & Hooker, R. S. (2020). Collaborative practice trends in US physician office visits: An analysis of the national ambulatory medical care survey (NAMCS), 2007–2016. *BMJ Open*, *10*(6). https://doi.org/10.1136/bmjopen-2019-035414
3. Al-Muhsen, S., Horanieh, N., Dulgom, S., Al Aseri, Z., Vazquez-Tello, A., Halwani, R., & Al-Jahdali, H. (2015). Poor asthma education and medication compliance are associated with increased emergency department visits by asthmatic children. *Annals of Thoracic Medicine*, *10*(2), 123–131. https://doi.org/10.4103/1817-1737.150735
4. Mishra, R., Kashif, M., Venkatram, S., George, T., Luo, K., & Diaz-Fuentes, G. (2017). Role of adult asthma education in improving asthma control and reducing emergency room utilization and hospital admissions in an inner-city hospital. *Canadian Respiratory Journal*, *2017*, 1–7. https://doi.org/10.1155/2017/5681962
5. Clasen, C. M., Vernon, S. W., Mullen, P. D., & Jackson, G. L. (1994). A survey of physician beliefs and self-reported practices concerning screening for early detection of cancer. *Social Science & Medicine*, 39(6), 841–849. https://doi.org/10.1016/0277-9536(94)90046-9
6. Cloutier, M. M., Salo, P. M., Akinbami, L. J., Cohn, R. D., Wilkerson, J. C., Diette, G. B., Elward, K. S., Mazurek, J. M., Spinner, J. R., Mitchell, T. A., & Zeldin, D. C. (2018). Clinician agreement, self-efficacy, and adherence with the guidelines for the diagnosis and management of asthma. *The Journal of Allergy and Clinical Immunology: In Practice*, *6*(3), 886–894. https://doi.org/10.1016/j.jaip.2018.01.018
7. Dolor, R. J., Østbye, T., Lyna, P., Coffman, C. J., Alexander, S. C., Tulsky, J. A., Brouwer, R. J., Esoimeme, I., & Pollak, K. I. (2010). What are physicians' and patients' beliefs about diet, weight, exercise, and smoking cessation counseling? Preventive Medicine, 51(5), 440¬–442. https://doi.org/10.1016/j.ypmed.2010.07.023
8. Bandura, A. (2004). Health promotion by social cognitive means. *Health Education & Behavior*, 31(2), 143–164. https://doi.org/10.1177/10901981042636603
9. National Asthma Education and Prevention Program. (2012). *Guidelines for the diagnosis and management of asthma (EPR-3)*. https://www.nhlbi.nih.gov/health-topics/guidelines-for-diagnosis-management-of-asthma

References

10. Akinbami, L. J., Salo, P. M., Cloutier, M. M., Wilkerson, J. C., Elward, K. S., Mazurek, J. M., Williams, S., & Zeldin, D. C. (2019). Primary care clinician adherence with asthma guidelines: The national asthma survey of physicians. *Journal of Asthma*, 57(5), 543–555. https://doi.org/10.1080/02770903.2019.1579831
11. Kan, K., Fierstein, J., Boon, K., Kanaley, M., Zavos, P., Volerman, A., Vojta, D., & Gupta, R. S. (2020). Parental quality of life and self-efficacy in pediatric asthma. *Journal of Asthma*, 58(6), 742–749. https://doi.org/10.1080/02770903.2020.1731825
12. Singh, S., Surani, S., Mcguinness, S., Eudicone, J., Gilbert, I., & Subramanian, S. (2020). Current practice patterns, challenges, and educational needs of asthma care providers in the United States. *Journal of Asthma*, *58*(8), 1118–1127. https://doi.org/10.1080/02770903.2020.1761980
13. Alicea-Planas, J., Pose, A., & Smith, L. (2015). Barriers to providing health education during primary care visits at community health centers: Clinical staff insights. *Journal of Community Health*, *41*(2), 220–225. https://doi.org/10.1007/s10900-015-0085-2
14. Luquis, R. R., & Paz, H. L. (2014). Attitudes about and practices of health promotion and prevention among primary care providers. *Health Promotion Practice*, 16(5), 745–755. https://doi.org/10.1177/1524839914561516
15. Yamada, J., Potestio, M. L., Cave, A. J., Sharpe, H., Johnson, D. W., Patey, A. M., Presseau, J., & Grimshaw, J. M. (2017). Using the theoretical domains framework to identify barriers and enablers to pediatric asthma management in primary care settings. *Journal of Asthma*, *55*(11), 1223–1236. https://doi.org/10.1080/02770903.2017.1408820
16. Alexander, G. C., Tajanlangit, M., Heyward, J., Mansour, O., Qato, D. M., & Stafford, R. S. (2020). Use and content of primary care office-based vs telemedicine care visits during the COVID-19 pandemic in the US. *JAMA Network Open*, *3*(10), e2021476–e2021476. https://doi.org/10.1001/jamanetworkopen.2020.21476
17. Alhajri, N., Simsekler, M. C., Alfalasi, B., Alhashmi, M., AlGhatrif, M., Balalaa, N., Al Ali, M., Almaashari, R., Al Memari, S., Al Hosani, F., Al Zaabi, Y., Almazroui, S., Alhashemi, H., & Baltatu, O. C. (2021). Physicians' attitudes toward telemedicine consultations during the COVID-19 pandemic: Cross-sectional study. *JMIR Medical Informatics*, 9(6). https://doi.org/10.2196/29251

Questions?