

Impact of Respiratory Therapy Education on Patient Self-Management in Asthma: Assessing the Influence of Educational Interventions on Patient Behaviors and Outcomes

Salem A. Alshahrani¹, Ahmed H. Alaqeily², Omar A Alzumai³, Tareq O. Alshehri⁴

Respiratory Therapist
Health affairs at the ministry of National Guard

Abstract:

This study investigates the impact of respiratory therapy education on patient self-management in asthma, focusing on how educational interventions influence patient behaviors and outcomes. We conducted a mixed-methods research with a quantitative component assessing changes in asthma control, medication adherence, and self-management behaviors before and after participation in the education program. Additionally, qualitative interviews were performed to gain deeper insights into patients' experiences and perceptions. The results demonstrated significant improvements in asthma control, with increased adherence to medication and better self-management practices among participants. Qualitative findings revealed enhanced understanding of asthma management, improved inhaler technique, and better awareness of triggers, though some barriers and challenges were noted. These findings underscore the effectiveness of structured educational interventions in improving patient outcomes and highlight the need for ongoing support to address implementation challenges.

Keywords: Asthma management, Respiratory therapy education, Patient self-management, Medication adherence, Asthma control, Educational interventions.

Introduction

Asthma is a chronic respiratory condition characterized by airway inflammation, bronchoconstriction, and increased mucus production, leading to variable symptoms such as wheezing, breathlessness, and cough (Bateman et al., 2008). Effective management of asthma requires a comprehensive approach that includes pharmacological treatment, lifestyle modifications, and patient self-management strategies. Self-management education is crucial in empowering patients to control their symptoms, adhere to treatment regimens, and make informed decisions about their health (Murray and O'Neill, 2018).

Respiratory therapy education plays a significant role in improving asthma outcomes by providing patients with the knowledge and skills necessary for effective self-management (Alotaibi, 2015): Educational interventions typically include instruction on proper inhaler techniques, understanding asthma triggers, and developing action plans to manage exacerbations Alotaibi (2015). Studies have shown that well-designed educational programs can lead to improved medication adherence, reduced frequency of asthma exacerbations, and enhanced quality of life for patients (Pinnock, 2015).

Despite these benefits, the impact of respiratory therapy education on patient behaviors and asthma outcomes remains a subject of ongoing research. There is a need for evidence that quantifies how specific educational interventions influence patient self-management and overall asthma control. Understanding this impact can inform the development of more effective educational strategies and support the integration of such interventions into routine respiratory therapy practice (Anise and Hasnain-Wynia, 2016).

This study aims to investigate how respiratory therapy education influences patient self-management in asthma. By evaluating the effects of educational interventions on patient behaviors and health outcomes, this research seeks to provide insights into the efficacy of current educational practices and identify areas for improvement.

Literature Review

1. The Role of Respiratory Therapy Education in Asthma Management

Asthma management involves both pharmacologic and non-pharmacologic strategies, with education being a critical non-pharmacologic component. Respiratory therapy education aims to enhance patient knowledge, skills, and self-management abilities. Effective education can significantly impact asthma outcomes by improving medication adherence, increasing understanding of disease management, and reducing emergency department visits (Alotaibi, 2015).

2. Educational Interventions and Their Impact

Several studies have demonstrated the positive effects of educational interventions on asthma management. A systematic review by Pinnock (2015) highlighted that patient education, including self-management training and inhaler technique instruction, can lead to significant improvements in asthma control and a reduction in exacerbations. Similarly, Alotaibi (2015) found that educational programs focusing on asthma triggers, medication use, and symptom monitoring were associated with better disease management and improved quality of life.

In a randomized controlled trial, Murray and O'Neill (2018) assessed the impact of a structured asthma education program on patient outcomes. They reported that patients who participated in the program showed better adherence to treatment plans, fewer asthma-related symptoms, and lower healthcare utilization compared to those who received standard care. These findings underscore the importance of targeted educational interventions in enhancing asthma self-management.

3. Challenges and Limitations in Asthma Education

Despite the benefits, there are challenges associated with asthma education. Anise and Hasnain-Wynia (2016) noted that while educational interventions can improve outcomes, their effectiveness is often influenced by factors such as the patient's level of health literacy, the quality of educational materials, and the delivery method. For instance, some studies have reported limited improvements in asthma control when educational interventions are not tailored to individual patient needs or when there is inadequate follow-up (Pinnock, 2015).

Additionally, there is variability in the implementation and adherence to educational programs. Research by Alotaibi (2015) suggests that the success of asthma education often depends on the integration of these programs into routine care and the ability of healthcare providers to address barriers to effective education.

4. Future Directions in Asthma Education Research

Future research should focus on optimizing educational strategies and exploring innovative approaches to enhance patient engagement and self-management. Investigating the role of digital tools, such as mobile apps and online platforms, could provide new avenues for delivering and reinforcing asthma education Alotaibi (2015). Additionally, more studies are needed to assess long-term outcomes and the cost-effectiveness of various educational interventions.

In summary, while respiratory therapy education plays a crucial role in asthma management, ongoing research is necessary to address existing challenges and improve educational practices. Effective education not only

empowers patients but also has the potential to significantly impact asthma control and overall health outcomes.

Methodology

1. Research Design

This study employed a quasi-experimental design to evaluate the impact of respiratory therapy education on patient self-management in asthma. The design included a pre-test and post-test evaluation to assess changes in patient behaviors and outcomes following the educational intervention.

2. Participants

The study involved 150 patients with asthma who were recruited from a respiratory clinic. Inclusion criteria included a diagnosis of asthma, a minimum age of 18, and the ability to provide informed consent. Exclusion criteria included severe cognitive impairment or inability to participate in educational sessions. Participants were randomly assigned to either the intervention group (n=75) or the control group (n=75).

3. Educational Intervention

The intervention group received a structured respiratory therapy education program consisting of:

- Educational Sessions: Four weekly sessions lasting 60 minutes each, focusing on inhaler techniques, asthma triggers, medication adherence, and the development of personalized action plans.
- Materials: Written and digital resources, including brochures, videos, and self-management tools.
- Follow-Up: Monthly telephone calls for three months to reinforce learning and address any issues.

The control group received standard asthma care, which included routine follow-up and basic asthma management information.

4. Data Collection

4.1. Instruments

Data were collected using the following instruments:

- Asthma Control Test (ACT): To measure changes in asthma control.
- Medication Adherence Scale (MAS): To assess adherence to prescribed asthma medications.
- Self-Management Behavior Questionnaire (SMBQ): To evaluate changes in self-management behaviors, such as monitoring symptoms and avoiding trigger.
- Qualitative Interviews: Semi-structured interviews with 20 participants from the intervention group to gather detailed feedback on their educational experiences.

4.2. Data Collection Procedures

- Pre-Intervention Data: Collected from all participants at baseline, including ACT, MAS, and SMBQ scores.
- Post-Intervention Data: Collected three months after the intervention, using the same instruments.
- Qualitative Data: Conducted via phone interviews, each lasting approximately 30 minutes, to gather insights into participants' experiences with the educational program.

5. Data Analysis

5.1. Quantitative Analysis

- Statistical Tests: Paired t-tests and independent t-tests were used to compare pre- and post-intervention scores within and between groups. Analysis of covariance (ANCOVA) was performed to adjust for baseline differences.

- Effect Size: Calculated to determine the magnitude of the intervention's impact.

5.2. Qualitative Analysis

- Thematic Analysis: Interview transcripts were analyzed using thematic analysis to identify recurring themes and sub-themes related to participants' experiences and perceived benefits of the educational intervention.

6. Ethical Considerations

- Informed Consent: All participants provided written informed consent before participating in the study.

- Confidentiality: Participant data were anonymized and stored securely.

- Ethical Approval: The study was approved by the ethics committee.

Findings

Measure	Group	Pre-Intervention Mean (SD)	Post-Intervention Mean (SD)	Statistical Significance	
Asthma Control Test (ACT) Score	Intervention	14.2 (3.1)	18.3 (2.5)	t(148) = 7.12, p < 0.001	
	Control	13.8 (3.3)	14.1 (3.4)		
Medication Adherence Scale (MAS)	Intervention	14.2 (3.1)	4.0 (0.7)	t(148) = 6.45, p < 0.001	
	Control	3.3 (0.8)	3.3 (0.9)		
Self-Management Behavior Questionnaire (SMBQ)	Intervention	42.1 (10.5)	55.2 (8.9)	t(148) = 8.23, p < 0.001	
	Control	41.8 (11.2)	43.0 (10.3)		

1. Enhanced Understanding and Knowledge

1.1. Improved Inhaler Techniques

- Participant 1: "Before the sessions, I wasn't sure if I was using my inhaler correctly. Now I feel much more confident and know how to use it properly."

- Participant 2: "The step-by-step guidance on inhaler use was incredibly useful. I've noticed fewer issues with my asthma since learning the correct technique."

1.2. Better Awareness of Triggers

- Participant 3: "I learned a lot about identifying my triggers and avoiding them, which has made a big difference in managing my asthma."

- Participant 4: "The education helped me understand what causes my asthma attacks and how to avoid those triggers more effectively."

2. Increased Adherence and Self-Management

2.1. Consistent Medication Use

- Participant 5: "I'm now more disciplined about taking my medications regularly, thanks to the education and follow-up calls."
- Participant 6: "Before the program, I often missed doses. Now, I make sure to take my medication as prescribed."

2.2. Effective Use of Action Plans

- Participant 7: "Having a clear action plan helps me manage my symptoms better and feel more in control of my condition."
- Participant 8: "The action plan we created together has been a great tool for managing my asthma on a daily basis."

3. Challenges and Barriers

3.1. Initial Resistance to Change

- Participant 9: "It was hard for me to change my routine at first, but the support I received made it easier."
- Participant 10: "Adapting to the new routines was challenging, but with time and encouragement, it became more manageable."

3.2. Follow-Up and Reinforcement

- Participant 11: "The sessions were helpful, but more frequent follow-ups would have been even better."
- Participant 12: "While the education was beneficial, I feel additional check-ins would have helped reinforce the information more effectively."

Discussion

This study explored the impact of respiratory therapy education on patient self-management in asthma and revealed several key findings.

1. Improved Asthma Control

The significant increase in Asthma Control Test (ACT) scores among the intervention group highlights the effectiveness of the educational intervention. This improvement aligns with previous studies indicating that targeted education can enhance asthma control (Juniper et al., 1999; Nathan et al., 2004). Participants reported a better understanding of their condition and increased confidence in managing their asthma, which contributed to this positive outcome.

2. Enhanced Medication Adherence

The increase in Medication Adherence Scale (MAS) scores for the intervention group suggests that the educational sessions effectively promoted consistent medication use. Similar findings have been reported in other studies, where structured education and follow-up support led to improved adherence to asthma medications (Murray and O'Neill, 2018; Dalcin et al., 2011). The reinforcement provided through follow-up calls was crucial in helping patients maintain their adherence levels.

3. Improved Self-Management Behaviors

The significant rise in Self-Management Behavior Questionnaire (SMBQ) scores in the intervention group indicates that the educational program successfully fostered better self-management practices. This finding is consistent with research showing that patient education programs can enhance self-management behaviors

and overall asthma control (Murray and O'Neill, 2018). Participants' improved use of action plans and trigger avoidance strategies contributed to this outcome.

4. Challenges and Barriers

Despite the positive outcomes, several challenges were noted. Participants initially experienced resistance to changing their routines, a common issue in behavioral interventions (Pinnock, 2015). Additionally, while the educational sessions were beneficial, some participants suggested that more frequent follow-up could enhance the program's effectiveness. This feedback underscores the importance of ongoing support in maintaining behavioral changes (Watkins et al., 2016).

5. Implications for Practice

The findings suggest that incorporating structured educational interventions into asthma management programs can significantly improve patient outcomes. Healthcare providers should consider implementing comprehensive education programs that include practical demonstrations and regular follow-ups to maximize their effectiveness. Addressing barriers such as resistance to change and providing continuous support can further enhance patient adherence and self-management.

6. Limitations and Future Research

This study's limitations include its quasi-experimental design and the reliance on self-reported measures, which may introduce bias. Future research should consider using randomized controlled trials and incorporating objective measures of asthma control and medication adherence. Additionally, exploring the long-term impact of educational interventions and identifying strategies to address resistance to change could provide valuable insights.

References

1. Alotaibi, G. A. (2015). Asthma control and self-management: The role of asthma education. *Saudi Journal for Health Sciences*, 4(1), 16-22.
2. Anise, A., & Hasnain-Wynia, R. (2016). Patient-centered outcomes research to improve asthma outcomes. *Journal of Allergy and Clinical Immunology*, 138(6), 1503-1510.
3. Bateman, E. D., Hurd, S. S., Barnes, P. J., Bousquet, J., Drazen, J. M., FitzGerald, M., ... & Zar, H. J. (2008). Global strategy for asthma management and prevention: GINA executive summary. *European Respiratory Journal*, 31(1), 143-178.
4. Dalcin, P. D. T. R., Grutcki, D. M., Laporte, P. P., Lima, P. B. D., Viana, V. P., Konzen, G. L., ... & Pereira, R. P. (2011). Impact of a short-term educational intervention on adherence to asthma treatment and on asthma control. *Jornal Brasileiro de Pneumologia*, 37, 19-27.
5. Juniper, E. F., Svensson, K., Mork, A., & Staum, S. (1999). Asthma control test: A new questionnaire to measure asthma control. *Journal of Allergy and Clinical Immunology*, 104*(2), 1112-1118.
6. Nathan, R. A., Sorkness, C. A., Kosinski, M., & Schatz, M. (2004). Development of the asthma control test: a survey of patients with asthma. *Journal of Allergy and Clinical Immunology*, 113*(1), 59-65.
7. Murray, B., & O'Neill, M. (2018). Supporting self-management of asthma through patient education. *British Journal of Nursing*, 27(7), 396-401.
8. Pinnock, H. (2015). Supported self-management for asthma. *Breathe*, 11(2), 98-109.

9. Watkins, K., Fisher, C., Misaghian, J., Schneider, C. R., & Clifford, R. (2016). A qualitative evaluation of the implementation of guidelines and a support tool for asthma management in primary care. *Asthma research and practice*, 2, 1-16.

Appendix A: Semi-Structured Interview Questions

Introduction:

Thank you for participating in this interview. Your responses will help us understand the impact of respiratory therapy education on asthma self-management. There are no right or wrong answers; we are interested in your honest feedback.

1. Understanding of Asthma Management

- 1.1. Can you describe your understanding of asthma and how it affects your daily life?
1.2. What specific aspects of asthma management were covered in the education program you participated in?

2. Impact on Self-Management

- 2.1. How has the education program influenced your ability to manage your asthma on a daily basis?
2.2. Can you provide examples of how the program has changed your medication use or self-care routines?

3. Inhaler Technique and Medication Adherence

- 3.1. What changes have you made in how you use your inhaler since participating in the program?
3.2. How has your adherence to medication changed as a result of the education?

4. Awareness of Triggers

- 4.1. How has the program helped you identify and manage asthma triggers?
4.2. Can you describe any new strategies you use to avoid or mitigate these triggers?

5. Challenges and Barriers

- 5.1. Did you encounter any difficulties in implementing the strategies learned during the program?
5.2. What aspects of the education program did you find most challenging or difficult to adopt?

6. Recommendations for Improvement

- 6.1. What additional support or resources would have been helpful for you in managing your asthma?
6.2. Do you have any suggestions for improving the asthma education program?

7. Overall Experience

- 7.1. How would you rate your overall experience with the asthma education program?
7.2. Would you recommend this program to others with asthma? Why or why not?

Appendix B: Questionnaire

Instructions :

Please answer the following questions based on your experiences with the respiratory therapy education program. Your responses will help us evaluate the effectiveness of the program.

Section 1: Background Information

- 1.1. Age: _____
1.2. Gender: _____
1.3. Duration of asthma diagnosis (years): _____

Section 2: Asthma Control

2.1. How often do you experience asthma symptoms (e.g., wheezing, shortness of breath)?

- Never
- Rarely
- Sometimes
- Often
- Always

2.2. How would you rate your overall asthma control on a scale from 1 (very poor) to 10 (excellent)?

Section 3: Medication Adherence

3.1. How often do you follow your prescribed medication regimen as directed?

- Always
- Most of the time
- Occasionally
- Rarely
- Never

3.2. How confident are you in using your inhaler correctly on a scale from 1 (not confident) to 10 (very confident)? _____

Section 4: Self-Management Behaviors

4.1. Do you use an asthma action plan?

- Yes
- No

4.2. How often do you review and update your asthma action plan?

- Daily
- Weekly
- Monthly
- Rarely
- Never

Section 5: Impact of Education

5.1. To what extent has the education program improved your knowledge about asthma management?

- Not at all
- A little
- Moderately
- Very much
- Extremely

5.2. How likely are you to continue using the strategies and information provided in the program in the future?

- Very unlikely
- Unlikely
- Neutral
- Likely
- Very likely

Section 6: Overall Satisfaction

6.1. Overall, how satisfied are you with the asthma education program?

- Very dissatisfied
- Dissatisfied
- Neutral

- Satisfied
- Very satisfied

6.2. Would you recommend this program to other asthma patients?

- Yes
- No

Additional Comments:

Please provide any additional comments or suggestions you have about the asthma education program.
