

Recent developments in asthma education

Michael D. Cabana^{a,b,c} and Janet M. Coffman^{c,d}

^aDepartment of Pediatrics, ^bDepartment of Epidemiology and Biostatistics, ^cPhilip R. Lee Institute for Health Policy Studies and ^dDepartment of Family and Community Medicine, School of Medicine, University of California, San Francisco (UCSF), San Francisco, California, USA

Correspondence to Michael D. Cabana, MD, MPH, 3333 California Street, Suite 245, San Francisco, CA 94118, USA
Tel: +1 415 514 2660;
e-mail: michael.cabana@ucsf.edu

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Purpose of review

Asthma education is a key component of the National Heart, Lung, and Blood Institute (NHLBI) asthma guidelines. Although the benefits and importance of asthma patient education are well documented, there are still many open questions regarding how to best provide asthma education. The following review highlights recent developments in this topic.

Recent findings

Recent innovations have applied asthma education in a variety of settings. Ensuring that health professionals within a community provide consistent educational messages about asthma can create synergy and leverage limited healthcare resources to improve outcomes. In addition, children seem to have greater responsibility for self-management of asthma at younger ages.

Summary

Further work is needed to understand how clinicians can best educate and give parents anticipatory guidance about how to best teach and transfer asthma self-management skills to young children. By developing teaching and mastering self-management skills at an early age, children may be able to carry such skills into adulthood. Finally, given the prevalence of healthcare disparities, there is a continued need for rigorously evaluated programs that are culturally appropriate and effective.

Keywords

asthma education, coaching, culturally competent care, self-management

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Introduction

Successful management of asthma requires that patients master many skills. Patients need to recognize asthma symptoms, follow complex medication regimens, control environmental triggers, and navigate care in a complex healthcare system with multiple providers. However, the one common component for each of these facets of asthma management is patient education, the final common pathway to self-management. The National Heart, Lung, and Blood Institute (NHLBI) asthma guidelines recognize this issue and recommend that healthcare providers teach and counsel all families and patients about these skills and reinforce patient education as a routine part of clinical care [1].

Previous reviews have noted common themes for effective patient education. Successful educational interventions are driven by an underlying behavioral theory [2]. Asthma education focused on improving patient self-management skills and recognition of symptoms also tend to be more successful than educational interventions focused only on improving patient knowledge. In addition, educational interventions that are more interactive tend to be more successful than passive edu-

cational strategies, such as lectures or distribution of print materials [3].

Previous systematic reviews noted that patient asthma education improves objective measures of lung function and decreases missed days of school, frequency of asthma symptoms as well as healthcare utilization [4]. Further work has validated the importance of asthma educational interventions. A recent meta-analysis [5] included a total of 37 randomized controlled trials evaluating the effect of asthma educational interventions for children (2–17 years of age). The results suggested that asthma education leads to decreases in mean hospitalizations and mean emergency department visits. However, the interventions varied in terms of types of education provided (e.g. individual, group, family), the number of sessions and the type and number of topics covered. As a result, it is difficult to assess which components of the interventions were most critical to success and to compare the cost-effectiveness of different interventions.

Another recent meta-analysis focused on the effects of asthma education on children who recently had an emergency department visit for asthma. A recent systematic review [6] examined whether asthma education directed at

such children and/or their parents who leads to improved health outcomes. In the analyses, 38 studies involving 7843 children were included. Asthma education was associated with a reduced risk of subsequent emergency department visits and hospital admissions for children in intervention groups compared with children in control groups.

Although the benefits and importance of asthma patient education are well documented, there are still many open questions regarding how to best provide asthma education. The following review highlights recent developments on this topic. For example, although asthma is managed in primary care settings, patients come into contact with healthcare professionals in many different settings such as the emergency department or the pharmacy. Recent work has focused on what type of asthma education is effective in different settings. In addition, patients may have different learning styles or may be receptive to different ways of presenting new information. Additional work has focused on how to best tailor asthma education to patient characteristics. Finally, with the development of pay-for-performance measures, asthma education is increasingly being recognized as a marker of quality of care.

Asthma education in different settings

The NHLBI guidelines suggest that asthma education 'should occur at all points of care where health professionals interact with patients who have asthma, including clinics, medical offices, emergency departments and hospitals, pharmacies, homes and community sites' [1]. Recent work has explored different settings in which to conduct asthma education.

Schools have been used as a setting for asthma education in several interventions. This setting is a logical and practical one, as children spend a significant portion of their weekdays at school and children are accustomed to receiving instruction in school. A recent systematic review [7^{••}] of 25 randomized controlled trials of school-based asthma education programs suggested that school-based programs enhance knowledge of asthma, self-efficacy and self-management behavior. However, there were less consistent effects on frequency of symptoms and healthcare utilization. These later outcomes may be more dependent on factors outside the school setting. Solitary school-based interventions may be insufficient to improve health, especially if children do not access to quality medical care or have chronic exposure to environmental triggers. The results from these analyses underscore the need for asthma education to be integrated into a comprehensive approach to medical care in as many settings as possible [1].

The potential synergistic effect of nurse education and pharmacist education was demonstrated in a recent study

Key points

- Patient education is a critical requirement for patients to successfully manage their disease.
- Ensuring that health professionals within a community provide consistent educational messages about asthma can create synergy and leverage limited healthcare resources to improve outcomes.
- Further work is needed to understand how to best educate parents how to best teach and transfer asthma self-management skills to young children.
- There is a continued need for rigorously evaluated asthma education programs that are culturally appropriate and effective.

[8] in Taiwan. Ninety-one asthma adult patients were randomized to receiving nurse-administered education, nurse and pharmacist education, or routine care. Both intervention groups demonstrated improvement in knowledge compared with controls after 6 months; however, clinical symptom improvement was significant only in the group that received both nursing and pharmacist counseling. The number of well designed clinical trials involving pharmacist-led asthma education is limited. A review [9[•]] of 25 studies published over the last 11 years suggests that asthma educational interventions involving pharmacists do not always have consistent benefits, but have been associated with improvements in asthma symptom frequency and severity.

Although asthma action plans are a recommended component of an asthma education program [1], the effectiveness of an asthma action plan alone has not been clear. A systematic review [10] of seven randomized clinical trials assessing the effectiveness of an individualized management plan for asthma (versus no plan) showed no consistent evidence of better outcomes, such as healthcare utilization, missed days from school or work, or medication adherence. This issue is even more critical in the treatment of asthma in the emergency department setting, where there can be situations with limited time, competing demands and limited resources for formal education.

It can be difficult to provide formal asthma education in busy settings, such as the pediatric emergency room. In some cases, written materials or a short term action plan may need to suffice. Ducharme *et al.* [11[•]] conducted a randomized controlled trial with 219 children to evaluate the effect of providing a written action plan and prescription versus prescription only. In this study, medication adherence at 28 days after discharge and medical follow-up was higher in the group receiving an asthma action plan compared with the group not receiving an asthma action plan. This study suggests at least a short-term marginal benefit to providing an asthma action plan alone

in a busy emergency department setting, where time is limited for asthma education.

Finally, another potential 'setting' for asthma education is via the telephone. Garbutt *et al.* [12] used a randomized controlled trial design to evaluate the effectiveness of a 12-month structured telephone coaching program. The coaches were nurses with at least 2 years of experience. The program was based on the transtheoretical model and focused on four common asthma messages. With a community-based sample of 362 families with children aged 5–12 years with persistent asthma, education and support provided by trained coaches was compared to routine care. Although there were no changes in emergency department visits or hospitalizations, there were significant improvements in asthma-related quality of life scores, as well as the proportion of children with poorly controlled asthma. This type of program might be useful to supplement an existing clinic system, as it did not require clinic-redesign or retraining of the primary care providers.

Research in asthma education has been conducted in a variety of settings. In the end, the most feasible and most appropriate approaches will probably vary across communities, based on different community strengths and resources. However, ensuring the greatest number of health professionals within a community collaborate or at least provide the same consistent asthma education messages can only create synergy to improve health outcomes.

Tailoring asthma education to the patient

Cultural competency skills enhance a provider's ability to counsel effectively in situations where a patient's customs, beliefs, or values differ. Differences in beliefs, attitudes towards medications, or cultural interpretations about disease can affect a patient's likelihood of accepting or rejecting asthma educational messages. There is a dearth of rigorously evaluated cultural competency training programs in asthma as well as culturally appropriate asthma educational materials [13].

One strategy is to develop and implement culturally specific asthma education programs. For example, the CALMA Program was developed to address asthma education needs in Puerto Rico. CALMA is a Spanish acronym for 'Take Control, Empower Yourself and Achieve Asthma Management'. The eight CALMA asthma education modules are culturally adapted to address specific misperceptions about asthma in Puerto Rico, as well as asthma triggers specific to the island, commonly used home remedies, and to provide culturally congruent illustrations [14]. A review of four studies including two pediatric studies found that culturally specific pro-

grams were more effective than nonculturally specific programs or usual care. Outcomes included improved asthma quality of life and asthma knowledge scores for children [15••].

Another strategy is to recruit asthma educators who share the same ideas, beliefs, and values as the patients being served. For specific geographic areas, indigenous health-care workers (IHW) are one strategy to enhance the effectiveness of asthma education programs. Indigenous peoples refer to a 'group of people who have inhabited a country for thousands of years, which often contrast with those of other groups of people who reside in the same country for a few hundred years' [16]. A systematic review found two small randomized controlled trials which compared involvement of an IHW versus the absence of an IHW. The review concluded that the involvement of an IHW was associated with improved child and parent knowledge, improved parent skills and decreased days absent from school [17].

Community health workers (CHWs) are 'lay members of communities who work either for pay or as volunteers in association with the local healthcare system in both urban and rural environments and usually share ethnicity, language, socioeconomic status and life experiences with the community members they serve' [18]. CHWs have been used for home visits to facilitate asthma environmental interventions. Evaluations have been conducted in urban settings and recently in rural settings, as well. Interestingly, in many studies the effects do not seem to be mediated by specific environmental changes [19,20]. Instead, the effectiveness of CHWs may be due to their effects on enhancing healthcare access, promoting medication adherence, and reinforcing asthma educational messages. Krieger *et al.* [21] conducted a recent randomized controlled trial, assessing the marginal effect of additional CHW home visits to traditional clinic-based asthma education. Patients included 309 children (3–13 years of age) with asthma living in low-income households. The results showed that adding CHW home visits to clinic-based education led to increased symptom-free days and a modest improvement in caretaker quality of life.

Work in this area is critical in addressing current asthma healthcare outcomes. Given the growing diversity of the population and prevalence of healthcare disparities, there is a continued need for rigorously evaluated programs that are culturally appropriate and effective.

Children as their own primary caregivers

Although asthma education is primarily focused on parents when children are very young, it is not clear when the responsibility of asthma management is transferred to

children. Valente *et al.* [22] conducted a cross-sectional telephone survey of 351 parents of children (4–19 years of age) prescribed daily asthma controller medication. As expected, as children increased in age, the likelihood of responsibility in ensuring receipt of their daily medication increased. However, even by age 7, children on average had assumed responsibility for daily medications in one out of five patients. By age 11, children assumed daily medication responsibility for about 50% of cases.

The study suggests that clinicians need to assume that children play a primary role in management of their daily asthma medications. As a result, it is important for clinicians to include young children when providing education regarding the use of asthma medications and other key asthma management tasks. Building on this idea, further work is needed to understand how clinicians can best educate and give parents anticipatory guidance about how to best teach and transfer asthma self-management skills to young children. By developing teaching and mastering self-management skills at an early age, children may be able to carry such skills into adulthood.

Additional trends regarding asthma education

The provision of appropriate education and counseling for patients with asthma is increasingly being viewed as an important marker of quality of care in the primary care setting. Using a combination of expert opinion and published evidence, To *et al.* [23] developed a list of the 15 performance indicators of primary care for asthma. The highest rated asthma primary care performance indicator was ‘asthma education from certified asthma educator’.

Provision of asthma education requires an investment of provider time and resources, which can be substantial at both the healthcare clinic and system level. Detailed analyses of proposed legislation in California to expand coverage for pediatric asthma self-management education in health maintenance organizations were recently published. The cost estimates assume that the increase in marginal cost is somewhat mitigated, due to potential decreased costs for emergency department visits or hospitalizations. However, the greater availability of asthma education services may also lead to greater healthcare utilization, due to the need for increased provider time for counseling, increased medication adherence and medication costs. For an increase in utilization of clinic-based asthma education by 10% for symptomatic children, there would be a total increase in costs of US\$ 5 million or US\$ 0.025 per member per month [24]. This analysis provides some indication of the marginal economic investment needed to expand coverage for pediatric asthma self-management education in this setting.

Conclusion

Patient education is a critical requirement for patients to successfully manage their disease. Recent innovations have applied asthma education in a variety of settings. Ensuring that all health professionals in all settings within a community provide consistent educational messages about asthma can create synergy and leverage limited healthcare resources to improve outcomes. In addition, children seem to have greater responsibility for self-management of asthma at younger ages. Further work is needed to understand how clinicians can best educate and give parents anticipatory guidance about how to best teach and transfer asthma self-management skills to young children. By developing teaching and mastering self-management skills at an early age, children may be able to carry such skills into adulthood. Finally, given the prevalence of healthcare disparities, there is a continued need for rigorously evaluated asthma education programs that are culturally appropriate and effective.

References and recommended reading

Papers of particular interest, published within the annual period of review, have been highlighted as:

- of special interest
- of outstanding interest

Additional references related to this topic can also be found in the Current World Literature section in this issue (pp. 000–000).

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