Original Article

An Electronic Asthma Self-Management Intervention for Young African American Adults

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What is already known about this topic? Young African American adults with asthma have significantly worse outcomes. Educational interventions that can recruit and retain these patients are needed.

What does this article add to our knowledge? A 6-week tailored electronic asthma self-management intervention was successful in retention of young African American adult asthma participants, with more than 80% completing the program. Improvements in asthma quality of life and asthma control were also observed.

How does this study impact current management guidelines? Asthma education for a traditionally difficult-to-reach population may best be delivered through a theory-based electronic intervention that is tailored to the specific challenges and goals of the participant.

BACKGROUND: Health disparities are seen in many chronic conditions including asthma. Young African American adults represent a population at high risk for poor asthma outcomes due to both their minority status and the difficult transition from adolescence to adulthood. Recruitment and retention has been challenging in this demographic stratum, and traditional asthma education is often not feasible.

OBJECTIVE: The objective of this study was to develop and assess the feasibility of an electronic asthma self-management program for young African American adults.

METHODS: A total of 44 African American adults (age 18-30 years) with uncontrolled persistent asthma were enrolled in an asthma self-management program. The 6-week Breathe Michigan program (predicated on the social cognitive theory) was tailored specifically to the concerns and preferences of young African American adults. The entire program was completed electronically, without any specialized human support. At 2 weeks and 3 months after program completion, participants were contacted for follow-up.

RESULTS: A total of 89% of enrolled subjects completed the 6-week intervention, and 77% were available for evaluation at 3 months. All subjects completing the 2-week postprogram survey reported that the program was helpful, and 97% would recommend it to others. Asthma control as measured by the Asthma Control Test improved from 16.1 to 19.3 ($P < .01$), and asthma quality of life as measured by the Mini Asthma Quality of Life Questionnaire improved from 4.0 to 5.1 ($P < .01$).

CONCLUSIONS: The Breathe Michigan program is feasible for recruitment and retention, and demonstrated an improvement in asthma control and quality of life for young African American adults. © **2015 American Academy of Allergy, Asthma & Immunology (J Allergy Clin Immunol Pract 2015;■:■-■)**

Key words: *Asthma; African American; Health disparities; Adolescent; Young adult; Asthma education; Asthma self-management; Health information technology; Electronic; Computer*

Health disparities are seen in many chronic conditions, including asthma. In the United States, asthma prevalence and disease burden disproportionately affect African Americans compared with white Americans. From 2008 to 2010, the annual US asthma prevalence was 11.9% for African Americans compared with 8.1% in Caucasians.[1] Although the prevalence rate is somewhat higher, the control measures, morbidity, and mortality rates are much worse among African Americans. From 2007 to 2009, the mortality rate from asthma was 0.23 per 1000 patients per year for African Americans versus 0.13 per 1000 patients per year for whites.[1] In addition, from 2001 to 2009, compared with white patients, African American patients had a greater number of emergency department visits (18.4 vs 6.1 visits per 100 patients per year) and hospitalizations (2.8 vs 1.3 visits per 100 patients per year) due to asthma.

Young African American adults represent a population particularly at risk for poor asthma outcomes due to both their minority status and the difficult transition from adolescence to

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Abbreviations used
ACT- Asthma Control Test
AQLQ- Mini Asthma Quality of Life Questionnaire

adulthood—a challenging time for the majority of individuals regardless of race. In young adulthood, individuals may be faced with new responsibilities including family care/romantic relationships, finances, living independently, employment, education, and responsibility for their own health care.[2] Therefore, it is critically important to implement programs to improve asthma management in this population.

Our team has previously identified barriers to optimal asthma management in young African American adults with asthma through detailed focus group analyses.[3] These barriers include a busy lifestyle, poor medication compliance, and lack of support from asthma health care providers. This population, however, was motivated to participate in an asthma self-management program. They were especially interested in programs that provided information to better manage their asthma, as well as interventions that could be delivered electronically (thereby allowing intervention completed at a time convenient to the learner) and included actors of color.[3]

Previous investigation and implementation of asthma self-management interventions have proven beneficial in other populations, such as older adults and women.[4,5] However, dropout rates can be high, especially among young adults and minority populations.[6,7] In addition, self-management interventions appear most effective when predicated on a behavioral theory of change.[8] The goal of this study was to assess if a theory-based electronic asthma self-management program could successfully retain young African American adult participants, and if such a program could have positive effects on asthma control and quality of life.

METHODS

Subjects

Potential subjects were recruited who met the following inclusion criteria: age 18 to 30 years, self-identified as African American, accessed email at least 3 times per week, and had a primary care physician. Participants also had to have uncontrolled persistent asthma, which was defined as currently using a controller medication (inhaled corticosteroids, inhaled corticosteroids plus long-acting β-agonist, cromolyn, or a leukotriene modifier) on a daily basis or using a rescue medication more than 2 times per week. During the eligibility screening interview, potential subjects were asked to rate their asthma control over the past month. If they rated their asthma as "not at all controlled," "poorly controlled," or "somewhat controlled," they were eligible for participation. Those who stated that their asthma was "well controlled" or "completely controlled" were excluded from participation, unless they stated that they were using their rescue medication more than 2 times per week. Participants were excluded if they had any other significant cardiopulmonary disease, had a greater than 20 pack-year smoking history (as this level has been associated with the development of chronic obstructive pulmonary disease),[9] had a significant cognitive impairment that would make participation in the program impossible, or were pregnant at the time of enrollment (as the Breathe Michigan program was not optimized to address unique issues of asthma in pregnancy).

Participants were recruited from the University of Michigan and 2 community clinics. One of the community clinics is a federally qualified health center, which provides care for individuals without insurance. The other clinic served adolescents and young adults exclusively, often without insurance. A convenience sample approach was adopted to reach the targeted sample size, utilizing an asthma registry at each site. Baseline information collected included age, school and employment status, children, history of smoking, age of asthma diagnosis, number and type of asthma medications prescribed, use of peak flow meter or asthma action plan, and asthma control and asthma quality of life as measured by the Asthma Control Test (ACT)[10] and the Mini Asthma Quality of Life Questionnaire (AQLQ),[11] respectively. Participants were provided a total of $120 over the 3-month program to encourage participation. The study was approved by the University of Michigan Institutional Review Board, and all subjects provided written informed consent.

Intervention

The Breathe Michigan program is based on the social cognitive theory, which utilizes the principles of self-regulation with support. Social cognitive theory has been well described in the literature and has been used extensively in interventions dealing with human health behavior.[12,13] Briefly, the theory postulates that the most influential way in which a person develops expectations and solidifies a behavioral change is through personal experience. Through this self-regulatory process, the person is able to observe and learn from their experience and determine ways for changing behavior. This process has been shown to build confidence and strengthen the commitment to continuing new behavior.

The Breathe Michigan program was created and tailored specifically to the challenges facing young African American adults with asthma.[3] It was completed entirely electronically and, therefore, could be done at a time and place convenient to the participant. As the intervention was completed electronically online, it required no specialized human support unless initiated by the participant.

Through the Breathe Michigan program, participants were introduced step by step to a self-regulatory problem-solving process, specifically designed within their cultural context. The Breathe Michigan program was completed over a period of 6 weeks. Approximately every 3 days, participants were asked to log in to a website and complete a specific assignment. These assignments included choosing problems related to asthma for their situation, identifying barriers to optimal care, and receiving tailored messages of support to overcome barriers. The asthma problems were selected from a list of 13 problems frequently experienced by young African American asthma patients based on our previous research, and are listed in Table E1 (available in this article's Online Repository at www.jaci-inpractice.org/). For the barrier selection, participants had the option of choosing 4 choices from among a list of 21 barrier options, again based on previous research.[3] These options are listed in Table E2 (available in this article's Online Repository at www.jaci-inpractice.org/). After barrier selection, participants received a tailored message every 3 days describing methods to overcome one of the 4 barriers selected. Each barrier support message was written by the study team members (with assistance from social work specialists as appropriate), and contained 1 to 2 paragraphs of information along with relevant links to additional videos and websites as appropriate.

During the program, participants watched 5 educational videos. The videos were produced by the study team exclusively for the Breathe Michigan program and were geared to the communication