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Original article

The Detroit Young Adult Asthma Project: Pilot of a Technology-Based Medication Adherence Intervention for African-American Emerging Adults

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A B S T R A C T

Purpose: To conduct a randomized controlled pilot of a multicomponent, technology-based intervention promoting adherence to controller medication in African-American emerging adults with asthma. The intervention consisted of two computer-delivered sessions based on motivational interviewing combined with text messaged reminders between sessions.
Methods: Participants (N = 49) were 18–29 years old, African-American, with persistent asthma requiring controller medication. Participants had to report poor medication adherence and asthma control. Youth were randomized to receive the intervention or an attention control. Data were collected through computer-delivered self-report questionnaires at baseline, 1, and 3 months. Ecological Momentary Assessment via two-way text messaging was also used to collect "real-time" data on medication use and asthma control.
Results: The intervention was feasible and acceptable to the target population, as evidenced by high retention rates and satisfaction scores. Changes in study outcomes from pre- to post-intervention favored the intervention, particularly for decrease in asthma symptoms, $t(42) = 2.22$, $p < .05$ (Cohen's $d = .071$).
Conclusions: Results suggest that the intervention is feasible and effective. However, findings are preliminary and should be replicated with a larger sample and more sophisticated data analyses.

IMPLICATIONS AND CONTRIBUTION

Technology-delivered interventions can be provided cheaply and easily to unprecedented proportions of persons with a given behavioral risk factor such as poor adherence. This study pilots a technology-delivered intervention specifically targeting adherence in African-American emerging adults with persistent asthma.

Racial and ethnic minority youth tend to have poorer asthma control, marked by more frequent and severe asthma symptoms and attacks, than white youth [1], even after controlling for socio-economic variables [2]. Consistent daily use of asthma "controller" medications is the primary treatment recommendation to prevent asthma exacerbations (i.e., asthma attacks, including symptoms such as shortness of breath, excessive coughing, and difficulty breathing, typically requiring use of a rescue medication and/or medical intervention) from occurring in people with persistent asthma [3]. The consequences of poor adherence include illness complications and fatal asthma exacerbations [4]. Despite these risks, the research and intervention literature on asthma management in racial/ethnic minority adolescents and emerging adults are limited [5].

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The current project included African-Americans in emerging adulthood [6], a developmental period (ages 18–29 years) marked by increased risk for illness consequences [7,8]. Emerging adulthood is a time of identity exploration, new social networks, independence and risk-taking, and decreased parental support [6]. However, research focused on the transition to adulthood has been almost exclusively conducted with predominately white samples [9]. Preliminary research indicates that minority youth may experience emerging adulthood differently than their white peers [10,11] and face unique challenges due to societal stereotypes [9]. This suggests that interventions need to consider developmental stage, culture, and context and be targeted specifically to minority youth.

Technology (e.g., cell phones and computers) may hold promise for delivery of targeted, brief interventions for emerging adults since most already tend to use such technologies in their daily lives [12]. A number of successful technology-based interventions have been conducted with youth with asthma [13–16], though no previous studies have specifically targeted African-American emerging adults. Technology-delivered interventions cannot replicate the important human elements of traditional interventions; however, they may offer tremendous advantages in terms of reach, replicability, anonymity, cost, and time. The current project used Computerized Intervention Authoring Software (CIAS, developed by Dr. Steven Ondersma, Wayne State University, Detroit, MI), an interactive software technology [17], to deliver a brief intervention based on the principles of motivational interviewing (MI) [18]. MI is a client-centered, goal-oriented method of communication for enhancing intrinsic motivation to change behavior through the exploration and resolution of ambivalence [19]. MI adaptations for youth with chronic conditions have shown strong effects [20,21], and one meta-analysis suggested stronger effects in studies targeting minorities [22].

The project presented here is a randomized controlled pilot of a multicomponent, technology-based intervention promoting medication adherence in African-American emerging adults. The goal of the study was to develop and preliminarily test the feasibility and initial efficacy of this intervention versus a comparison control in n = 50 youth. The intervention consisted of two CIAS-delivered motivational sessions combined with individualized text messages. Youth were randomized to the intervention or to a comparison control condition, both of which were delivered using CIAS. We expected the intervention would be feasible and acceptable to youth as evidenced by retention ≥80% and high client satisfaction. We hypothesized that youth in the intervention condition would show greater improvement in adherence than those in the control. We also expected that youth in the intervention would show greater improvement in asthma control than those in the control condition.

Methods

Participants and procedures

Youth were recruited from an urban university and an affiliated medical center. Participants had to be 18–29 years old, African-American, diagnosed with persistent asthma, and prescribed a controller medication to be eligible. Participants also had to have access to a cell phone with texting capability and report <80% adherence in the past 30 days and score ≤19 on the Asthma Control Test (ACT) [23]. When medication was not on hand to confirm current prescription, self-report was confirmed by contacting the pharmacy. Exclusion criteria included pregnancy, inability to understand written or spoken English, having another serious medical condition requiring regular medication, and/or an active psychiatric disorder that would interfere with study participation. The Human Investigation Committees at the university and medical center approved the project. Of 62 youth approached, three refused screening and 10 were ineligible, yielding a final sample of 50 who provided informed consent and 49 who were randomized (Figure 1).

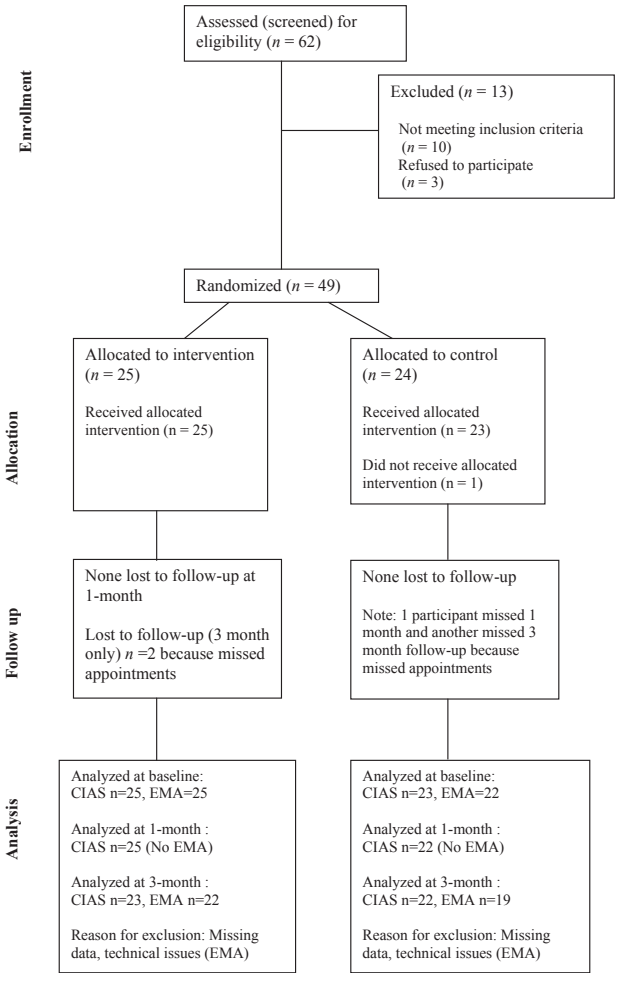

Figure 1. Consolidated Standards of Reporting Trials flow diagram.

The timing and flow of procedures for data collection and sessions are detailed in Figure 2. Participants completed informed consent with the research assistant. After this, youth were oriented to the procedures for Ecological Momentary Assessment (EMA). For 7 consecutive days, participants were prompted for their asthma symptoms and medication use via two-way text messages sent to their personal cell phones. Baseline data collection and Session 1 occurred in the research laboratory (or an alternative location of the participant's choosing) via CIAS immediately after the EMA period. After completing the questionnaires, the computer automatically randomized them to receive either the intervention (n = 25) or control (n = 24), which was also delivered via CIAS. After completing the first intervention/control session, participants received 30 days of text messages to take controller medication