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Fostering African-American Improvement in Total Health (FAITH!): An Application of the American Heart Association's Life's Simple 7™ among Midwestern African-Americans

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Abstract

Objective—African-Americans have a strikingly low prevalence of ideal cardiovascular health metrics of the American Heart Association's Life's Simple 7 (LS7). This study was conducted to assess the impact of a community-based cardio-vascular disease prevention intervention on the knowledge and achievement of cardiovascular health metrics among a marginalized African-American community.

Methods—Adult congregants ($n = 37$, 70 % women) from three African-American churches in Rochester, MN, participated in the Fostering African-American Improvement in Total Health (FAITH!) program, a theory-based, culturally-tailored, 16-week education series incorporating the American Heart Association's LS7 framework. Feasibility testing included assessments of participant recruitment, program attendance, and retention. We classified participants according to definitions of ideal, intermediate, and poor cardiovascular health based on cardiac risk factors and health behaviors and calculated an LS7 score (range 0 to 14) at baseline and post-intervention. Knowledge of cardiac risk factors was assessed by questionnaire. Main outcome measures were changes in cardiovascular health knowledge and cardiovascular health components related to LS7

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Compliance with Ethical Standards All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Conflict of Interest All authors declare that they have no conflict of interest.

Informed Consent Informed consent was obtained from all individual participants included in the study.

from baseline to post-intervention. Psychosocial measures included socioeconomic status, outlook on life, self-reported health, self-efficacy, and family support.

Results—Thirty-six out of 37 recruited participants completed the entire program including health assessments. Participants attended 63.5 % of the education series and attendance at each session was, on average, 62 % of those enrolled. There was a statistically significant improvement in cardiovascular health knowledge ($p < 0.02$). A higher percentage of participants meeting either ideal or intermediate LS7 score categories and a lower percentage within the poor category were observed. Higher LS7 scores correlated with higher psychosocial measures ratings.

Conclusions—Although small, our study suggests that the FAITH! program is a feasible, community intervention promoting ideal cardiovascular health that has the potential to improve cardiovascular health literacy and LS7 among African-Americans.

Keywords

Cardiovascular disease; Community-based participatory research; Health promotion; Health disparities; African-American

Introduction

African-American adults continue to have striking disparities in cardiovascular disease (CVD) morbidity and mortality compared to whites, which has been mostly attributed to behavioral risk factors such as poor nutrition and physical inactivity [1]. CVD disparities among African-Americans in Minnesota (MN) mirror national patterns, as they have higher premature mortality rates for CVD and stroke than the overall, predominantly white state population [2–4]. National prevention campaigns have outlined specific goals to address these health disparities through health promotion and education [3, 5–7].

The US Department of Health and Human Services (DHHS) defined the national initiative, Healthy People 2020, to improve the cardiovascular health of all Americans [8]. As a means to objectively measure progress towards ideal cardiovascular health, the American Heart Association (AHA) devised the Life's Simple 7 (LS7) construct [5]. LS7 is inclusive of four modifiable health behaviors (physical activity, diet, smoking, and body mass index (BMI)) and three modifiable biological factors (blood pressure (BP), total cholesterol, and fasting glucose). Strikingly, less than 1 % of African-Americans meet ideal levels of all cardiovascular health components [5, 9, 10]. Recent, large-scale, epidemiological studies reveal that the dismally-low proportion of African-Americans meeting each ideal cardiovascular health component contributes to their higher CVD incidence in comparison to whites [11, 12]. Similarly, a low prevalence of ideal cardiovascular health components was observed in a population of predominantly white Minnesotans [13]. While African-Americans were included in the study, race-specific data were not available as they were included collectively in the "not white" category. Furthermore, a higher number of ideal cardiovascular health components has been associated with lower CVD risk and incidence of myocardial infarction and stroke among African-Americans [14]. In addition to highlighting the need for tracking progress towards achievement of ideal LS7 in African-Americans, these studies also call for community-based interventions targeting multiple health behaviors within this population. If effective, these interventions have the potential to make a substantial public health impact in eradicating CVD health disparities.

Previous community-based interventions in African-American communities have shown impact in improving cardiac risk factors through tailored health education [15–21] with the most effective emphasizing community engagement with faith-based or civic organizations, individualized wellness plans, and attention to psychosocial variables such as self-efficacy and social support networks [16]. The purpose of our pilot study was to assess the feasibility and impact of a community-based CVD prevention program entitled, "Fostering African-American Improvement in Total Health (FAITH!)," on the LS7 components among underserved, African-Americans residing in a Midwestern region. We also sought to examine the relationship between ideal cardiovascular health and psychosocial variables such as socioeconomic status (education and income levels), outlook on life, self-reported health status, self-efficacy (towards improved fruit/ vegetable intake, dietary fat/salt intake, and physical activity) and family support. We hypothesized that our educational intervention would increase knowledge of the LS7 components and improve the prevalence of ideal cardiovascular health in a high-risk group of African-Americans. To our knowledge, there are no current behavioral interventions among African-Americans utilizing the LS7 framework to examine ideal cardiovascular health.

Methods

Community Engagement and Context

In 2013, three predominantly African-American churches in Rochester, MN, expressed interest to the study investigators in developing an academic-community partnership for a health and wellness program within their respective congregations. For contextual perspective, Rochester, MN, is a small metropolitan area where blacks (including African descendants and African immigrants/refugees) make up 6.3 % of the population compared with 5.9 % of the entire state of MN [22]. A community-based participatory research (CBPR) approach was implemented for program development and implementation to meet the community needs using previously published methods [23]. This was the first collaboration with the local African-American community and our medical institution on a lifestyle intervention and there was no pre-existing working relationship with the churches. The three churches provided letters of intent indicating their commitment to promote program recruitment and participation. Each church pastor identified liaisons (FAITH! Partners) within their congregation to work alongside study investigators on program design and implementation. Four focus groups were held from December 2013 to June 2014 with church leadership as part of the PRECEDE-PROCEED model [24] assessment and study planning phases to discuss the congregations' health needs, assess barriers to achieving ideal cardiovascular health and perceptions about health disparities and medical research which helped to further tailor the program. The information gleaned from these meetings helped to further refine the intervention education curriculum including specific topics and education session format, timing, and locations. FAITH! Partners reviewed and approved all promotional and educational materials as well as health assessment surveys.

Study Design and Participants—Participant eligibility criteria included age ≥18 years and worship service attendance at any of the participating churches, to ensure exposure to the intervention components. The three partnering churches were small in size (ranging from 50 to 100 members) and combined constituted approximately 200 congregants (range 50 to 75 % adults aged ≥18 years). Thus, an estimated 100 members met the study eligibility criteria. The study recruitment goals were set at one FAITH! Partner per church (three total) and an average of 10 study participants per church (30 total). FAITH! Partners assisted with participant recruitment through church event announcements, flyers, organization meetings, and kickoff events in August 2014. The program education/implementation phases took place from September 2014 to December 2014 and the maintenance phase from January 2015 to April 2015. Post-intervention health assessment and evaluation occurred in April 2015. The study was reviewed and approved by the Mayo Clinic and University of Minnesota Institutional Review Boards.

Intervention

The FAITH! program is a 16-week, community-based intervention focused on CVD prevention through healthy lifestyle change. The educational intervention curriculum was adapted from the original FAITH! nutrition education program which applied a conglomerate of health education theories including the health belief and community mobilization models and the social cognitive theory construct [23]. At enrollment, each participant received a FAITH! program manual entitled, "FAITH! Action Manual" which was culturally-tailored by including personal letters with spiritually-motivated messaging from the church pastors as well as photographs of the FAITH! Partners. The manual also included supportive educational resources adapted from the AHA LS7 framework and other culturally-appropriate materials such as an educational booklet developed specifically for African-Americans on heart healthy living [25–27]. A cookbook entitled, "FAITH!fully Cooking with Flavor!" which included low-fat, low-calorie recipes customized with traditional African-American meals was also provided [28]. A series of eight 90-min education sessions were held bi-weekly at the churches and community facilities according to designated church preferences (e.g., Saturday mornings or Sunday afternoons) which included interactive lectures and videos on relevant LS7 cardiovascular health topics, cooking demonstrations, and exercise classes (Table 1) [25–28]. Each session opened with a prayer, participant testimonies and personal reflections on their learnings and adoption of lifestyle behavioral change. Multidisciplinary Mayo Clinic health professionals and staff including cardiologists, general internists, a registered dietician, and a certified culinary chef delivered the education sessions. To maintain relevance to African-Americans, the content for each session was adapted from the manual materials [27]. Moreover, the live cooking demonstration included selected recipes from the program cookbook [28] with healthier versions of traditional "soul food" (e.g., baked fried chicken). Healthy food samples and individual incentives (e.g., local supermarket gift certificates, pedometers, local health club memberships, heart healthy cookbooks, and Mayo Clinic Healthy Heart for Life books) for program participation and follow-up surveys completion were provided to promote healthy lifestyle maintenance.

Data Collection and Measures

Assessments were performed at baseline, immediate post-program, and 3 months post-intervention. After informed consent, we collected sociodemographic information, self-reported health history, health status, and barriers towards leading a healthy lifestyle [29]. Additional assessments included the following: program evaluation, the role of religious/spiritual beliefs and wellness on health [30], and the importance of academic-community partnerships and research participation perceptions [31]. Participant attendance was recorded at each education session by the study team. Anthropometrics were measured at baseline and 3 months post-intervention according to National Health and Nutrition Examination Survey (NHANES) guidelines including height (measured without shoes to the nearest centimeter by a stadiometer), weight (using a calibrated scale in kilograms), and waist circumference (by a measuring tape to the nearest centimeter) [32]. BMI was computed as weight (kg) divided by squared height (m^2). BP was measured according to AHA guidelines (average BP of three sitting readings) with an oscillometric automated device [33]. Clinical laboratory studies including non-fasting lipid panel and hemoglobin A1c were collected by venous blood samples and analyzed by the Mayo Clinic Central Laboratories standardized protocols at baseline and 3 months post-intervention. All participants received their individual results to survey, anthropometric and laboratory data at baseline and 3-month follow-up.

Outcome Variables and Metrics

Intervention Feasibility—We assessed the feasibility of our intervention utilizing quantitative and qualitative metrics of participation rates, program and speaker evaluations and program scalability. These included successful recruitment of FAITH! Partners and study participants, participant attendance of education sessions (goal >50 % attendance of education sessions by each participant and >50 % attendance of each education session by all participants), participant retention (goal >80 % of enrolled participants), and feedback obtained during surveys and participant interviews.

Cardiovascular Health Knowledge—We assessed participant knowledge of the LS7 components and pertinent cardiac risk factors at baseline, immediate post-program, and 3 months post-intervention by a questionnaire based on work by Wartak and colleagues [34]. The questionnaire also included CVD health disparities questions specifically related to African-Americans (see Online Resource 1 for full questionnaire).

Cardiovascular Health—We measured the four modifiable behavioral factors (physical activity, diet, smoking, adiposity) and three biological health factors (BP, cholesterol, glycemic control) according to the AHA's LS7 components. Criteria for each LS7 component (poor, intermediate, ideal) were adapted from AHA standards based on available collected data (Table 2) [35–37]. We devised an LS7 score as a composite of each LS7 component as previously outlined by Thacker and colleagues by the assignment of 2 points for ideal, 1 point for intermediate, or 0 points for poor [38]. The total sum allowed for a continuous measure of cardiovascular health with a range from poor to ideal (0 to 14 points). To allow for ease of translation and understanding, the LS7 score was categorized as 0 to 6 (poor), 7 to 8 (intermediate), and 9 to 14 (ideal).

Psychosocial Measures—We included the following key psychosocial measures: socioeconomic status (education level and annual household income), outlook on life, self-reported health, self-efficacy, and family support. Outlook on life and health status was assessed by the question, "In general, would you say your overall outlook on life/health status is?" with answer selections on a Likert scale as: 1 = poor, 2 = fair, 3 = good, 4 = very good, and 5 = excellent. These categories were collapsed into three groups: poor to fair, good, and very good to excellent. Self-efficacy was assessed using previously validated questionnaires for behavioral factors of diet (fruit/vegetable intake, dietary fat/ sodium intake) and physical activity [36, 39]. Family support for physical activity was examined using a similar survey [36].

Statistical Analysis

We generated descriptive statistics for all variables including means and standard deviations (SD) for continuous variables and frequencies and percentages for categorical variables. We calculated changes in measures by subtracting measurements at baseline from the post-intervention measurements. Paired *t* tests were used to compare average knowledge scores between baseline, immediate post-program, and 3 months post-intervention time points. The overall distribution of each LS7 component according to category (poor, intermediate, and ideal) was tabulated, and compared between baseline and 3 months post-intervention with McNemar's tests. The LS7 score, a compilation of all seven cardiovascular health components was calculated for participants with complete information for all seven components. Due to limited sample size, only selected statistical comparisons were performed, with the majority of the data summarized descriptively only. Statistical significance was set at $p < .05$. All statistical analyses were performed using SAS version 9.3 (SAS Institute, Incorporated; Cary, North Carolina).

Results

Intervention Feasibility Testing

A total of four FAITH! Partners (one to two per church) and 37 study participants were recruited from the three participating church congregations. Each participant attended an average of 4.5 education sessions (63.5 % of complete education series) over the course of the intervention. On average, 62 % of enrolled study participants attended a given education session. The participant retention rate was high as all but one participant completed the entire program.

Participant Characteristics

Baseline demographic characteristics of study participants are shown in Table 3. The participants' mean age was 51.7 years (range 24 to 79). Participants were primarily women (70 %). The majority reported having at least some postsecondary education (74 %), an annual household income of less than US$50,000 (61 %) and health insurance (69 %). The most common self-reported cardiac risk factors were obesity, hypertension, and hyperlipidemia. Cited barriers to leading a healthy lifestyle included low self-perceived risk for CVD, lack of confidence, family obligations, poor understanding of the specifics of implementing lifestyle changes, and confusion by the media.

Table 4 displays the cardiac risk factor profiles and psychosocial measures over the course of the study. At baseline, the study cohort cardiac risk profile was the following (median values): BP 141/86 mmHg, total cholesterol 190 mg/dL, hemoglobin A1c 5.8 %, and waist circumference 102 cm. Forty-nine percent of participants described their outlook on life as "very good to excellent," while only 23 % reported being in "very good to excellent" health. Mean self-efficacy values pre-intervention for fruit/vegetable intake, dietary fat/salt intake, and physical activity were 4.2 (SD 0.9), 3.9 (SD 0.9), and 3.7 (SD 0.9), respectively, which remained relatively stable at 3 months post-intervention (scale 1 to 5, higher score is better). Reported family support for physical activity was approximately 2 to 3 days/week at baseline [average 2.2 (SD 1.1)] and 1 to 2 days/week at 3 months post-intervention [average 1.9 (SD 1.1)].

Cardiovascular Health Knowledge

Compared to baseline, immediately after the program, there was an increase in average percent correct on the cardiac risk factors knowledge questionnaire (48 versus 57 %, $p = 0.08$) which was maintained at 3 months post-intervention achieving statistical significance (48 versus 58 %, $p = 0.02$) (Table 4).

Cardiovascular Health

At baseline and 3 months post-intervention, none of the participants met all seven ideal cardiovascular health components. The mean number of ideal cardiovascular health components met was 3.5 (SD 1.8) which remained relatively unchanged at post-intervention. The calculated mean LS7 scores accounting for all LS7 components (range 0 to 14) were 8.8 (SD 2.5) and 8.2 (SD 2.1) at baseline and post-intervention, respectively. At baseline, 70 % of the sample was either within the ideal or intermediate categories for LS7 scores and 30 % was within the poor category. At 3 months post-intervention, these percentages improved to 82 % ideal or intermediate and 18 % poor.

Table 5 displays the proportions of participants meeting poor, intermediate, and ideal LS7 components at baseline and 3 months post-intervention. The proportion of participants meeting ideal levels of each LS7 component were the following (baseline versus 3 months post-intervention): smoking (91.9 versus 94.1 %), fruit/vegetable intake (14.3 versus 12.9 %), physical activity (60 versus 58.8 %), BMI (11.1 versus 12.5 %), BP (8.3 versus 12.5 %), total cholesterol (60.6 versus 66.7 %), and hemoglobin A1c (48.5 versus 40 %). There were notable trends in the LS7 components by income category (data not shown). The lowest income group (annual household income <US$20,000), had greater improvements in physical activity and BMI LS7 categories from poor to intermediate or ideal than the other income groups. The highest income group (annual household income >US$50,000) had a lower proportion of ideal level total cholesterol values at baseline and post-intervention.

Psychosocial Measures

The associations between the psychosocial measures and LS7 scores are presented in Table 6. Participants with a higher education level had higher LS7 scores at baseline than the other groups; however, all group scores approached one another at post-intervention. At baseline, the middle category income participants had higher LS7 scores than the lower income category; however, the groups had similar scores at post-intervention. Higher LS7 scores were seen among participants with ratings of “good” and “very good to excellent” outlook on life than those with “poor” ratings at baseline and post-intervention. In terms of self-reported health status ratings, the highest LS7 score at baseline was among those designating a good rating; however, at post-intervention, the highest was among those with a very good to excellent rating. There was a positive trend between sense of self-efficacy and increased fruit/vegetable intake, decreased dietary fat/sodium intake, increased physical activity, and higher LS7 scores at baseline. This corroborated with the increases in proportion of participants with higher self-efficacy scores from study start to completion (data not shown). The highest average LS7 scores (at baseline and post-intervention) among all psychosocial measures were among participants receiving support from family members on at least 1 or more days of the week to increase physical activity levels.

Discussion

Overall, the results of this pilot study show the feasibility of the FAITH! program for CVD prevention among African-Americans in a mid-sized, upper Midwest community given its achievement of recruitment goals, program attendance, and participant retention. There were primary findings of an increase in cardiovascular health knowledge with positive effects on LS7 cardiovascular health metrics over the course of the study. To the authors’ knowledge, this is the only culturally tailored, community intervention examining multiple CVD risk factors through a national guideline-based framework of the AHA LS7. At baseline, our study participants were at relatively high-risk for CVD based on their risk profiles showing pre-hypertensive/hypertensive range BPs and obese range BMI with central obesity. There was an increase in participants meeting either ideal or intermediate LS7 score categories and a decline in percentage meeting the poor LS7 category from pre- to post-intervention. Although marginal, there were also increases in the proportions of individuals meeting ideal levels of specific LS7 components such as smoking, BMI, BP and total cholesterol following the intervention. In addition, there was evidence of positive influence by psychosocial factors including outlook on life, self-reported health status, self-efficacy, and family support on LS7 scores.

Our study provides complementary and informative data on the prevalence of LS7 and ideal cardiovascular health among African-Americans residing in Midwestern USA. A recent cohort study examining the prevalence of LS7 among adult residents of New Ulm, MN, included an overwhelmingly racially homogenous population (95.7 % white) but no stratification by race [13]. Nonetheless, similar to our participants, the average ideal LS7 components met were 3.4 (SD 1.4). Among the individual LS7 components, our participants and the New Ulm cohort had extremely low ideal levels of cardiovascular health in terms of dietary patterns and BP at baseline. There were similar proportions of ideal smoking status and physical activity but contrasting ideal BMI, total cholesterol, and glycemic control. This suggests the need for interventions targeting both behavioral and biological cardiac risk parameters among both groups; however, with an emphasis on obesity and diabetes mellitus among African-Americans. In comparison to the Jackson Heart Study cohort from Jackson, Mississippi, which was also exclusively African-American, our participants had greater proportions of ideal levels (although suboptimal) at baseline across most LS7 components except for BP (lower) and BMI (identical) [40]. This underscores the importance of considering regional differences for cardiac risk assessment and intervention design among the African-American population.

Numerous studies have highlighted the effectiveness of health education interventions examining multiple cardiac risk factors within African-American congregations in other US areas such as the Mid-Atlantic and Stroke Belt/Buckle regions of the southern USA [15, 17, 18, 41–46]. However, to date, none have been reported in Midwestern African-Americans in MN. Consistent with prior studies of African-Americans within faith-based institutions, our findings demonstrate an overall proficiency of cardiovascular health knowledge; however, a clear disconnect between knowledge, health behaviors, and cardiac risk factors [47, 48]. The AHA-sponsored CVD intervention, “Search Your Heart” similarly provided health education in urban congregations and assessed CVD knowledge through a risk factor-focused survey. Although the majority of participants recognized key cardiac risk factors, the levels of AHA-recommended physical activity and fruit/vegetable intake were subpar. The pivotal church-based study, Project Joy, also examined behavioral and biological cardiac risk profiles among African-American women and showed modest improvements in weight loss, BP, diet, and physical activity after a 1-year community cardiovascular health promotion program [18]. However, the influence of key psychosocial variables including socioeconomic factors and self-efficacy on cardiovascular health components was not investigated. Our study offers a basis for further exploration of these factors, as study participants within the lower income bracket demonstrated the greatest improvements in key modifiable LS7 health behaviors. In addition, our findings of positive correlations between outlook on life, self-reported health status, and self-efficacy with LS7 scores, suggest the importance of personal sense of well-being towards achievement of healthy behavior change for African-American adults.

Strengths and Limitations

Our study has a number of strengths and innovative strategies which distinguishes the FAITH! program from other community interventions. Most noteworthy is its novel assessment of a health behavioral intervention within a marginalized and understudied group in Olmsted County, MN, as prior community interventions have, instead, largely engaged black immigrants [49–52] over African-Americans who have distinct cardiac risk factor profiles and psychosocial influences. Its use of key CBPR principles has extended the scope for academic-community partnerships to combat the severe underrepresentation of people of color and those from disadvantaged backgrounds in health-related research, particularly at academic medical centers [53, 54]. Our successful recruitment and low attrition rate was likely a reflection of incorporation of church liaisons (FAITH! Partners) and the church pastors in the development and promotion of intervention components and events. Furthermore, our program attendance goals were supported by incorporating feedback on program implementation (e.g., convenient days, times, and locations) received from the assessment/planning phase focus groups. Instead of using a “train the trainer” approach advocated by other investigators [47, 55] in which lay leaders largely implement the intervention, we upheld the collaborative spirit set forth by community engagement by keeping both parties (congregation and professional health educators) actively involved in all program phases. The intervention core curriculum included cohesive, evidenced-based health information addressing each LS7 component provided by healthcare experts through interactive and culturally tailored presentations. This addressed a clear need among our underserved group as many expressed the necessity of guidance and clarity on the appropriate recommendations for healthy lifestyle change at the initial assessment.

Prior church-based studies have demonstrated a significant decline in session attendance after health professionals discontinued leading sessions despite trained lay health educators [18]. Furthermore, pastors and congregation members have reported a greater confidence in expertled health education programs [18]. This highlights the importance of ongoing communication and embedded supportive mechanisms between partnering churches and medical institutions to ensure program sustainability. In our case, these joint capacity-building mechanisms resulted in our ability to secure grant funding to expand the program with the inclusion of other area church congregations. Finally, our analyses provided insight into the relationships between social determinants of health and the LS7 construct which has been recently endorsed by the DHHS and AHA [56, 57]. The LS7 components and scoring system provide an adaptable tool for CBPR researchers to objectively measure and track cardiovascular health among underserved populations. This metric's "simple" infrastructure and interpretability further facilitates dissemination of study findings to key stakeholders including community partners and policymakers [58]. This is especially important in communicating cardiac risk to at-risk populations who may lack the perception of their actual risk as demonstrated with our group.

There were several limitations and challenges overcome throughout this study. Our study was primarily limited by small sample size; however, this must be considered in the context of the largely ethnically uniform community from which we recruited our participants. Also, the intervention was non-randomized and did not include a control comparison group. Moreover, this is a feasibility study of a CVD prevention intervention in a cohort not previously studied within the Midwestern region; thus, there are no prior intervention studies for comparison. Nonetheless, it represents a conscientious starting point to assess intervention efficacy through research and community engagement. Our LS7 assessment lacked a comprehensive assessment of diet (e.g., food frequency questionnaire of fat, fiber, sodium, fish intake) and physical activity, as brief, focused questionnaires were requested through church leader feedback to decrease participant survey burden. This adjustment did not adversely influence our results or interpretation of the LS7 metrics. Missing data limited our analyses of the LS7 in all participants as some lacked both behavioral survey information and biological samples at baseline and post-intervention. Lastly, the short study duration may account for the lack of substantial improvements in the LS7 components, (e.g., BP and glycemic control) as a longer timeframe may be required to observe clinically significant changes. Despite these limitations, our study provides preliminary findings to inform a larger controlled trial of longer duration to investigate the sustained effects of the FAITH! program on health behavior change to impact LS7 measures.

Conclusions

The FAITH! program demonstrates a feasible, health education intervention promoting ideal cardiovascular health behaviors through community engagement and social support networks with faith-based organizations. This is evidenced by its excellent participant engagement and retention, ability to increase cardiovascular health knowledge, and potential to foster behavioral change towards alleviating cardiovascular health disparities among African-Americans. Future community interventions may be strengthened with a focus on psychosocial influences to simultaneously improve health behaviors and factors to prevent CVD within this high-risk group.

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Table 1

FAITH! program education session curriculum

Session	Topic	Attendance, *n*[b]
1	Overview of heart disease risk factors	37
2	Obesity and the importance of physical activity[a]	19
3	High cholesterol	18
4	Heart healthy eating: nutrition label reading and healthy cooking[a]	18
5	Heart attack warning signs	17
6	High blood pressure	16
7	Diabetes and the heart	27
8	Healthy lifestyle maintenance inventory: evaluation, personal reflections, barriers, challenges	36
Supportive education materials		
	• My Life Check®, Live Better with Life's Simple 7™ (AHA) [25]	
	• 7 Steps to a Healthy Heart (ABC) [26]	
	• On the Move to Better Heart Health for African-Americans (NHLBI, NIH) [27]	
	• Heart Healthy Home Cooking African-American Style (NHLBI, NIH) [28]	

ABC Association of Black Cardiologists, Incorporated, *AHA* American Heart Association, *NHLBI* National Heart, Lung and Blood Institute, *NIH* National Institutes of Health

[a] Joint session with all churches

[b] Number of participants from all three churches combined

Table 2

Life's Simple 7 components criteria

Component	FAITH! study	American Heart Association (AHA)
Smoking[a]	Ideal: self-reported "never" or "former" smoker	Ideal: self-reported "never" or "former" smoker >1 year
	Poor: self-reported current smoker	Intermediate: former ≤1 year
		Poor: self-reported current smoker
Diet[b]	Ideal: ≥5 servings of fruits/vegetables consumed per day	Ideal: diet score 4 to 5 points
	Intermediate: 3 to 4 servings of fruits/vegetables consumed per day	Intermediate: diet score 2 to 3 points
	Poor: ≤2 servings of fruits/vegetables consumed per day	Poor: diet score 0 to 1 points
Physical activity[c]	Ideal: ≥150 total moderate intensity activity minutes per week	Ideal: ≥150 min per week of moderate intensity or ≥75 min per week of vigorous intensity activity
	Intermediate: 1 to 149 total moderate intensity activity minutes per week	Intermediate: 1 to 149 min per week of moderate intensity or 1 to 74 min per week of vigorous intensity activity
	Poor: 0 total moderate intensity activity minutes per week	Poor: None
Body mass index	Ideal: <25 kg/m^2	Ideal: <25 kg/m^2
	Intermediate: 25 to 29.9 kg/m^2	Intermediate: 25 to 29.9 kg/m^2
	Poor: ≥30 kg/m^2	Poor: ≥30 kg/m^2
Blood pressure[d]	Ideal: <120/80 mmHg	Ideal: <120/80 mmHg, untreated
	Intermediate: 120 to 139/80–89 mmHg	Intermediate: 120 to 139/80 to 89 mmHg, or treated to ideal level
	Poor: ≥140/≥90 mmHg	Poor: ≥140/90 mmHg
Total cholesterol[d]	Ideal: <200 mg/dL	Ideal: <200 mg/dL, untreated
	Intermediate: 200 to 239 mg/dL	Intermediate: 200 to 239 mg/dL or treated to ideal level
	Poor: ≥240 mg/dL	Poor: ≥240 mg/dL
Glycemic control[d,e]	Undiagnosed diabetes:	
	Ideal: hemoglobin A1c <5.7 %	Ideal: fasting glucose <100 mg/dL, untreated
	Intermediate: hemoglobin A1c 5.7 to 6.4 %	Intermediate: fasting glucose 100 to 125 mg/dL or treated to ideal level
	Poor: hemoglobin A1c ≥6.5 %	Poor: fasting glucose ≥126 mg/dL
	Diagnosed diabetes :	
	Ideal: Not possible	
	Intermediate: hemoglobin A1c <6.5 %	
	Poor: hemoglobin A1c ≥6.5 %	

AHA American Heart Association, *DASH* Dietary Approaches to Stop Hypertension

[a] The FAITH! study did not survey time elapsed of quitting smoking for former smokers

[b] The AHA criteria included a healthy five component diet score based on the DASH Diet including fruits and vegetables, fish, fiber-rich whole grains, sodium, and sugar-sweetened beverages. The FAITH! study survey assessed fruit and vegetable intake

[c] Self-reported total weekly minutes of at least moderate intensity physical activity was calculated as a sum of moderate intensity minutes and a doubling of vigorous intensity minutes (to scale each vigorous intensity minute to moderate intensity minutes) using validated instruments [35, 36]

[d] The FAITH! study survey asked participants of diagnoses of hypertension, hyperlipidemia, and diabetes mellitus by a health care professional rather than treatment status as indicated in the AHA criteria

[e]The FAITH! study collected hemoglobin A1c levels rather than fasting glucose values. This has been supported as a stronger predictor of diabetes risk in a community-based study including African-Americans [37]

Table 3

Baseline characteristics of participants in the FAITH! Program

	***n* = 37**
Age, years, mean (range)	51.7 (24–79)
Gender	
Female	26 (70.3 %)
Marital status	
Single	11 (33.3 %)
Divorced/separated	9 (27.3 %)
Married/committed relationship	9 (27.3 %)
Widowed	4 (12.1 %)
Education	
Some high school	3 (8.8 %)
High school graduate or GED equivalent	6 (17.6 %)
Some college/technical or associate’s degree	10 (29.4 %)
College graduate	11 (32.4 %)
Advanced degree	4 (11.8 %)
Employment status	
Employed	19 (59.4 %)
Unemployed	13 (40.6 %)
Annual household income	
<US$20,000	11 (33.3 %)
US$20,000 to $49,999	9 (27.3 %)
>US$50,000	6 (18.2 %)
Choose not to disclose	7 (21.2 %)
Health insurance status	
Insured	24 (68.6 %)
Uninsured	8 (22.9 %)
Unknown	3 (8.6 %)
Self-reported medical history	
Obesity	22 (59.5 %)
Hypertension	10 (27.0 %)
Hyperlipidemia	8 (21.6 %)
Current tobacco use	3 (8.1 %)
Type 2 diabetes mellitus	2 (5.4 %)
Coronary artery disease	1 (2.7 %)
Barriers to leading healthy lifestyle	
I do not perceive myself to be at risk for heart disease	8 (21.6 %)
I am not confident I can change my behavior	7 (18.9 %)
I have family obligations and other people to take care of	6 (16.2 %)
I lead a healthy lifestyle	6 (16.2 %)
I am confused by what I am supposed to do to change my lifestyle	4 (10.8 %)

	n = 37
There is too much confusion in the media about what to do	4 (10.8 %)

Data are expressed as no. (%) unless otherwise indicated

Table 4

Cardiac risk, psychosocial measures and cardiovascular health knowledge at baseline and 3 months post-intervention

	Baseline (n = 37)	Post-intervention (n = 34)
Cardiac risk profile, median (Q1–Q3)		
SBP, mmHg	141 (126.3–165.2)	140.5 (126.5–152.7)
DBP, mmHg	85.8 (83.0–92.8)	82.0 (77.3–90.0)
Total cholesterol, mg/dL	190 (156–216)	188 (160–207)
Hemoglobin A1c, %	5.8 (5.4–6.1)	5.8 (5.4–6.1)
Waist circumference, cm	102 (92–112)	106 (99–115)
Body mass index, kg/m^2	32.1 (27.8–35.7)	32.9 (28.5–37.0)
Outlook on life		
Poor/fair	7 (20 %)	2 (6.1 %)
Good	11 (31.4 %)	11 (33.3 %)
Very good/excellent	17 (48.6 %)	20 (60.6 %)
Self-reported health status		
Poor/fair	10 (28.6 %)	7 (20.6 %)
Good	17 (48.6 %)	18 (52.6 %)
Very good/excellent	8 (22.9 %)	9 (26.5 %)
Self-efficacy, mean (SD)[a]		
Fruit/vegetable intake	4.2 (0.9)	4.2 (0.7)
Dietary fat/salt intake	3.9 (0.9)	4.3 (0.6)
Physical activity	3.7 (0.9)	3.8 (1.0)
Physical activity family support, mean days/week (SD)[b]	2.2 (1.1)	1.9 (1.1)
Cardiovascular health knowledge, average % correct	48	58 *

SBP systolic blood pressure, *DBP* diastolic blood pressure

[a] Average of items assessing self-efficacy to engage in healthy dietary and physical activity behaviors or choices. The number of items within each domain was: 8 (fruit/vegetable intake), 12 (dietary fat/salt intake), and 6 (physical activity) [36, 39]. (Scale for each item was 1 to 5: 1 = I am sure I cannot, 5 = I am sure I can)

[b] Physical activity family support is the average of three items assessing the frequency of support provided by family members towards engagement in physical activity or sports [36]. (Scale was 1 to 5: 1 = Never, 5 = Everyday)

* Significant difference between baseline and 3 months post-intervention ($p < 0.05$)

Table 5

Distribution of Life's Simple 7 components at baseline and 3 months post-intervention

Component	Baseline (*n* = 37)[a]	Post-intervention (*n* = 34)[b]
Smoking		
Poor (current smoker)	3 (8.1 %)	2 (5.9 %)
Ideal (not a current smoker)	34 (91.9 %)	32 (94.1 %)
Diet (fruit/vegetable intake)		
Poor (≤2 servings/day)	6 (42.9 %)	14 (45.2 %)
Intermediate (3–4 servings/day)	6 (42.9 %)	13 (41.9 %)
Ideal (≥5 servings/day)	2 (14.3 %)	4 (12.9 %)
Physical activity		
Poor (0 min of moderate activity/week)	8 (26.7 %)	4 (11.8 %)
Intermediate (1–149 min/week)	4 (13.3 %)	10 (29.4 %)
Ideal (≥150 min/week)	18 (60.0 %)	20 (58.8 %)
Body mass index		
Poor (≥30 kg/m^2)	23 (63.9 %)	20 (62.5 %)
Intermediate (25–29.9 kg/m^2)	9 (25.0 %)	8 (25.0 %)
Ideal (<25 kg/m^2)	4 (11.1 %)	4 (12.5 %)
Blood pressure		
Poor (SBP ≥140 mmHg or DBP ≥90 mmHg)	19 (52.8 %)	18 (56.3 %)
Intermediate (neither poor nor ideal)	14 (38.9 %)	10 (31.3 %)
Ideal (SBP <120 mmHg and DBP <80 mmHg)	3 (8.3 %)	4 (12.5 %)
Total cholesterol		
Poor (≥240 mg/dL)	4 (12.1 %)	2 (6.7 %)
Intermediate (200–239 mg/dL)	9 (27.3 %)	8 (26.7 %)
Ideal (<200 mg/dL)	20 (60.6 %)	20 (66.7 %)
Glycemic control[b]		
Poor (hemoglobin A1c ≥6.5 %)	6 (18.2 %)	3 (10.0 %)
Intermediate (hemoglobin A1c 5.7–6.4 %)	11 (33.3 %)	15 (50.0 %)
Ideal (hemoglobin A1c <5.7 %)	16 (48.5 %)	12 (40.0 %)

Data are expressed as no. (%)

SBP systolic blood pressure, *DBP* diastolic blood pressure

[a]Frequencies not adding up to the baseline total (37) or post-intervention total (34) indicate missing data

[b]Participants with self-reported diabetes were classified as intermediate (hemoglobin A1c <6.5 %) or poor (hemoglobin A1c ≥6.5 %)

Table 6

Life's Simple 7 scores by psychosocial measures at baseline and 3 months post-intervention[a]

Psychosocial measure	Baseline		Post-intervention	
	***n* = 10**	**LS7 score[b] mean (SD)**	***n* = 28**	**LS7 score[b] mean (SD)**
Education				
High school graduate or less	1	8.0 (−)	7	8.3 (2.3)
Some college/technical or associate's degree	3	8.0 (2.6)	7	7.7 (2.1)
College graduate or more	6	9.3 (2.8)	13	8.4 (2.2)
Household income				
<US$20,000	2	6.5 (0.7)	9	7.8 (2.0)
US$20,000-US$49,000	4	10.8 (1.9)	8	8.2 (2.1)
≥US$50,000	1	6.0 (−)	4	6.8 (2.5)
Outlook on life				
Poor/fair	1	6.0 (−)	2	7.5 (3.5)
Good	2	9.0 (4.2)	10	8.6 (1.6)
Very good/excellent	7	9.1 (2.3)	16	8.1 (2.3)
Overall health				
Poor/fair	2	6.5 (0.7)	4	7.0 (2.0)
Good	5	10.2 (1.6)	16	8.1 (2.1)
Very good/excellent	2	6.0 (0.0)	8	9.1 (1.9)
Fruit/vegetable intake self-efficacy				
I am sure I cannot/probably cannot	0	–	0	–
Neutral	2	6.5 (0.7)	8	8.0 (2.6)
I am sure I can/probably can	7	9.1 (2.6)	20	8.3 (1.9)
Dietary fat/salt intake self-efficacy				
I am sure I cannot/probably cannot	0	–	0	–
Neutral	1	8.0 (−)	7	9.0 (2.3)
I am sure I can/probably can	9	8.9 (2.7)	21	8.0 (2.0)
Physical activity self-efficacy				
I am sure I cannot/probably cannot	0	–	2	8.0 (2.8)
Neutral	4	7.5 (1.3)	9	7.1 (2.1)
I am sure I can/probably can	6	9.7 (2.9)	17	8.8 (1.9)
Physical activity family support				
Never	6	8.0 (2.3)	14	6.9 (1.6)
1–2 days/week	1	6.0 (−)	7	10.3 (1.7)
3+ days/week	3	11.3 (0.6)	6	8.3 (1.2)

LS7 Life's Simple 7

[a]Life's Simple 7 scores calculated for participants with complete information on all seven cardiovascular health components for baseline and post-intervention time points

[b]A point system was devised for each component by assigning 2 points for ideal, 1 point for intermediate, and 0 points for poor. All points were summed to yield a Life's Simple 7 score ranging from 0 (poor cardiovascular health) to 14 (ideal cardiovascular health) points [38]