

Promoting heart health and behavior change in a vulnerable older adult population

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Abstract

Background: Older minority populations in low socioeconomic classes are at high risk for cardiovascular disease, stroke, type 2 diabetes, and a host of other heart-related health conditions. Engaging in unhealthy behaviors such as poor diet, sedentary lifestyle, and poor use of health services is a major contributor to these health disparities. The Heart Health Program was developed to improve health outcomes by encouraging behavior change in a group of low-income older African Americans attending two urban senior centers. Using the Health Belief Model as a guiding framework, group sessions were conducted bi-weekly over the course of a three month period. Session leaders engaged participants in educational activities and helped to develop individual ‘action steps’, or actionable goals for each participant to strive toward as a means of improving heart health.

Methods: Twenty-five low-income, African American seniors participated in the Heart Health Program. A pre-post design was used to evaluate the acceptability and feasibility of the program.

Results: Participants reported high levels of satisfaction with the program as a whole and successful accomplishment of action steps. Results indicate limited long-term behavior change at the program’s conclusion.

Conclusions: Lessons were learned about implementing this type of behavior change program in a senior center focused on: preparation, logistics, and relationships between the project team, senior center staff, and participants. Based on the initial experience of the Heart Health Program, plans are underway to refine the program and broaden its delivery to more older adults.

Citation: Menne HL, Borato LM, Shelton EG, Johnson JD (2016) Promoting heart health and behaviour change in a vulnerable older adult population. *Healthy Aging Research* 5:11. doi: 10.1097 /01.HXR.0000508389.95382.e2

Received: December 31, 2015; **Accepted:** May 24, 2016; **Published:** September 1, 2016

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Competing interests: The authors have declared that no competing interests exist.

Sources of funding: University Hospitals Case Medical Center Community Benefit Grant Program

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Introduction

The importance of heart health in the United States is consistently emphasized by annual mortality statistics. Cardiovascular disease (CVD) has remained the leading cause of mortality in the U.S. for over 75 years [1]. Self-reported stroke prevalence remains high, with nearly 800,000 individuals experiencing a new or recurring stroke each year [2]. Heart-related diseases and disorders remain very common in the

U.S. because of a multitude of factors contributing to poor heart health. Disparities in heart health exist across age, race, ethnicity, and socioeconomic status (SES). The Heart Health Program was developed as an action-oriented intervention to encourage health behavior change, while remaining sensitive to the biosociocultural factors influencing such behaviors.

The present article focuses on three major risk characteristics for CVD and related disorders (e.g.

stroke and diabetes). The first risk characteristic is age. Older adults account for half of all cases of CVD, and 66% of deaths from CVD occur among those aged 75 years and older [3]. CVD incidence increases with age, with rates per 1,000 persons being 34.6, 59.2, and 74.4 for men aged 65–74, 75–84, and 85+, respectively, and 20.0, 40.2, and 65.2 for women in the respective age ranges. All these rates per 1,000 are significantly higher than for those under the age of 65 years [3]. The prevalence of diabetes among individuals over the age of 65 is substantially higher than other age groups, with 26.9% of older adults having received a diagnosis of diabetes and an additional 50% with fasting glucose levels indicative of prediabetes [2].

The second risk characteristic is race. Sociodemographic research examining chronic illness has consistently found that racial and ethnic minorities, especially African Americans, are at an increased risk for CVD and related risk factors. Overall, African Americans experience higher rates of cardiovascular deaths than the general population; higher rates of cardiovascular-related comorbidities including stroke, diabetes, and high blood pressure; and more additional cardiovascular risk factors, such as obesity and lack of a regular source of medical care [2, 4, 5]. African Americans also are more likely to use emergency departments and less likely to use recommended hospital care for cardiovascular treatment [6, 7]. Health disparities across racial groups are not completely understood, but cultural values and the stress experienced as a result of racism are thought to account for some of the inequities [8, 9].

The third risk factor is socioeconomic status (SES). In comprehensive longitudinal research, low SES has been tied to higher rates of mortality and morbidity [10, 11]. Individuals in the lowest socioeconomic brackets may face detrimental challenges to health such as malnutrition, low access to health care, and poor living conditions. However, SES serves as a predictor of negative health consequences across the entire SES spectrum, with high SES individuals demonstrating better health outcomes than individuals in only marginally worse socioeconomic positions [12].

While the complete relationship between race, SES, and poor health remains unclear, a substantial mediator of this relationship is thought to be lifestyle and health-related behaviors [11]. Such behaviors represent modifiable risk factors that, if changed, can prevent or delay the onset of morbidity and mortality. Using the Health Belief Model as a conceptual framework, the Heart Health Program aims to influence these health behaviors through a multifactorial approach of education and action-oriented goal-setting strategies.

The Health Belief Model

The Health Belief Model (HBM) has been used since the 1950s as a conceptual framework for understanding health behaviors and preventive health practices [13–15]. This model underscores the importance of a person's perceptions about a health issue and his or her self-efficacy [16]. Perceptions about a health issue include how the person perceives their susceptibility to poor health, the severity of the condition, the barriers to behavior change, and the benefits of making such changes. Self-efficacy is conceptualized as a person's belief in their ability to make and follow through with behavior changes. These factors, combined with a cue to action, have been identified by the HBM as critical as to whether or not a person will adopt healthy behaviors and/or change unhealthy behaviors. Table 1 contains a full account of these elements as well as the application of the elements to the Heart Health Program. It is important to note that the components of the HBM are primarily internal; that is, meaningful changes in health behavior come from within one's self. This sentiment is echoed by clinical approaches such as motivational interviewing, which aims to nurture intrinsic change from within, rather than imposing change upon an individual [17].

Health behavior and behavior change

Perceptions about health severity, susceptibility, benefits, and barriers likely have the greatest impact on engagement with respect to health behaviors that are convenient, and whose consequences for inaction are clear.

Table 1. The Health Belief Model and cardiovascular health: major concepts

HBM components	Definition	Intervention strategy	Application to Heart Health Program participants
Perceived susceptibility	One's opinion of the chances of getting a condition.	Define population(s) at risk, risk levels; personalize risk based on a person's features or behavior; heighten perceived susceptibility if too low.	Older adults feel they may be at risk of complications related to high blood pressure, heart disease, or other cardiovascular issues.
Perceived severity	One's opinion of how serious a condition and its consequences are.	Specify consequences of the risk and the condition.	Older adults believe the consequences of experiencing complications, or increased complications, because of cardiovascular issues are significant enough to attempt to avoid them.
Perceived benefits	One's belief in the efficacy of the advised action to reduce risk or seriousness of impact.	Define action to take; how, where, when; clarify the positive effects to be expected.	Older adults believe that participating in recommended healthy behaviors, such as better eating, more exercise, and less alcohol and tobacco use, will prevent them from experiencing higher rates of complications that arise from cardiovascular issues.
Perceived barriers	One's opinion of the tangible and psychological costs of the advised action.	Identify and reduce barriers through reassurance, incentives and assistance.	Older adults identify their personal barriers to completing heart-healthy behaviors as lack of time and support.
Cues to action	Strategies to activate 'readiness'.	Provide how-to information, promote awareness, create reminders.	Older adults in the Heart Health Program attend sessions presented by a community health nurse. Participants are encouraged to come up with small, achievable action steps that will lead to a healthier lifestyle. This action step planning time is supplemented with educational information about heart health.
Self-efficacy	Confidence in one's ability to take action	Provide training, guidance in performing action	Older adults in the Heart Health Program receive ongoing support, new knowledge, and encouragement to complete action steps on their own and with the support of peers.

For example, applying sunscreen or receiving a vaccine are relatively effortless health behaviors with direct and immediate outcomes (avoiding sunburn or an illness). Engaging in healthy eating habits, conversely, may be less strongly impacted solely by health perceptions because the behavior may a) be more difficult to maintain in order to positively impact health, and b) have more subtle health benefits in the immediate term. These types of sustained health habits, however, often have a more profound impact on health and well-being than convenient health behaviors. Thus, a major challenge for researchers and practitioners in health-related fields is to understand

the factors that contribute to behavior change, and which behaviors are more amenable to such change.

There are several factors to consider when designing a program aimed at encouraging health behavior change in older adult populations. First, behaviors negatively impacting heart health are often habitual and difficult to change. Moreover, these unhealthy behaviors frequently coexist, such that an individual may engage in several behaviors that all contribute to poor heart health. Interventions designed to focus on multiple health behavior changes often demonstrate greater efficacy than interventions targeting only one health behavior [18]. Research on obesity has indicated that dietary and exercise behavior change is significantly

more likely when participants are encouraged to create specific goals [19], and those goals are matched to the individual's readiness to change [20]. Interventions to improve health behaviors are most successful when they are intensive in content and target high-risk populations [21]. While individual-level behavior change interventions typically demonstrate the greatest outcome efficacy, these interventions tend to be very costly [22]. Group and classroom-based behavior change programs demonstrate similar efficacy compared to individual-level interventions at a lower cost [23].

A second important factor to consider is the relationship between age and health behavior change. The impetus for enacting behavior change may vary across different age groups, with younger adults more frequently attributing lack of behavior change to motivation, and older adults more frequently attributing inaction to confusion about which foods to eat and how to stay healthy [24]. Exercise, an important contributing factor for heart health, may be more difficult for older adults to initiate because of age-related declines in strength and prolonged inactivity. Research indicates, however, that older adults adapt and benefit greatly from cardiovascular and resistance-type exercises [25]. Unfortunately, exercise behavior change techniques focusing on self-regulation demonstrate less efficacy for older adults than middle-aged and younger adults [26]. Older adults also are more likely to have experienced a heart attack or a related heart condition, which can lead to 'cardiac invalidism', or the belief that one's heart is too frail to perform cardiovascular activities, even after sufficiently recovering from a cardiac event [27]. A study examining attitudes toward diet, exercise, smoking, stress relief, and a variety of other health behaviors revealed that older adults tended to be in one of two stages of the Transtheoretical Model of behavior change: either the 'pre-contemplation stage' (no acknowledgement that a problem exists) or the 'maintenance stage' (indicating that one has already made changes that they are maintaining) [20,28]. These results suggest that a large proportion of the older adult population may be either unaware or in denial about the benefits of making health behavior changes. Such attitudes toward healthy behaviors pose a substantial challenge for interventionists focusing on this population.

One method for supporting and encouraging behavior change among older adults is found in the evidence-based program BRI Care Consultation. BRI Care Consultation is based on an empowerment framework that assumes older adults have the capacity to make changes in their behavior if they have enough information and support [29]. The program was developed and tested for efficacy, effectiveness, and feasibility at the Benjamin Rose Institute on Aging (BRI; [30–32]). Standard delivery of BRI Care Consultation is via one-on-one phone and email communication between the Care Consultant and the older adult or family caregiver. During these communications the Care Consultant helps identify goals, and shares information and resources, in an effort to help the older adult or family caregiver make changes in his or her behavior. In addition, there is ongoing follow-up for monitoring progress and adding new goals and tasks. The Heart Health Program combines traditional education on heart health with the support, empowerment, and accountability elements of BRI Care Consultation. It is expected that this multi-method approach will be acceptable and feasible to a vulnerable older adult population, while also encouraging heart health behavior change.

Program protocol

The Heart Health Program was developed to provide quality education, support, and behavior change opportunities to a vulnerable population that is a) at highest risk for CVD and related disorders, and b) least likely to have access to such programming and services. The program is delivered by a Session Leader; a community health nurse educator with extensive clinical and education experience. A Project Assistant, who assists in creating and documenting 'action steps' for behavior change, and tracking evaluation data, accompanies the Session Leader.

Key features

The Heart Health Program has three key components. First is the Action Plan for heart-healthy behavior change. The methodology for the Action Plan is adapted from BRI Care Consultation [30–32]. Action Plans include simple and achievable 'action steps', or behaviors that are chosen by, and meaningful to,

program participants. Action steps gradually move a person toward their desired and sustained behavior change. Action steps are tracked by Care Consultants in the BRI Care Consultation Information System (CCIS) so that they can refer back and track changes in behavior over time.

Second, the Heart Health Program uses unique participant-driven or consumer-driven philosophies in which participants selected the Action Plan content after learning about strategies for reducing cardiovascular risk. Behavior changes chosen by participants are more likely to be acceptable, feasible, and sustainable. The program's Session Leader acts as a coach, who assists participants in formulating their Action Plans.

Third, the program is sensitive to the participating population of lower-income and/or minority older adults, who are at high risk for CVD and related disorders. By acknowledging and attending to the social context of the participants, the Session Leader delivers the tailored content and aids in creating action steps that can be successfully implemented. For example, educational materials are printed in large font and are easily readable. Risk factor information about age and race are included for relevant conditions such as CVD and type 2 diabetes. Educational activities such as Heart Health Bingo are used based on the activity preferences of the older adult participants in the Program, and the nutritional information behind cultural foods preferred by group members, such as hush puppies and spoon bread, is a focal point of dietary conversation.

Format of sessions

After an Introductory Session, the Heart Health Program consists of five structured, 60-minute sessions. The five sessions are: 1) Basics of Heart Health; 2) Problems, Signs, and Symptoms; 3) Lifestyle Choices; 4) Proper Care and Other Heart-Related Conditions; and 5) Stress, Coping, and Support. Each session is divided into three segments: 1) education and review of current knowledge about the topic (e.g., behaviors to promote heart health,

effective disease management); 2) group discussion and peer support (e.g., translating topical information into action steps); and 3) creation of new action steps and review of prior action steps. The Session Leader provides individualized guidance and coaching to help participants set and follow-up on action steps that are added to their Action Plan. After each session, the Project Assistant provides a printed version of the updated Action Plan, which lists all action steps, dates by which they are to be accomplished, and space to record barriers to accomplishment. Table 2 outlines each session's objectives.

Methods

Design

Data about the initial delivery of the Heart Health Program were collected through pre-program and post-program interviews. Participants were screened and interviewed directly prior to the launch of the program. Follow-up interviews took place three months after the program ended. Because the goal of the program was to measure the feasibility and accessibility of this intervention, no control group was used. All eligible participants from a local senior center who wanted to take part in the Heart Health Program were included, and divided into one of two groups that met bi-weekly over a three-month period. Participants were eligible for inclusion in the Heart Health Program if they met the age requirement of 60 years or older, and stated that they had a willingness to attend the Program sessions. All sessions took place at the Paul Alandt Lakeshore Rose Center for Aging Well.

Sample

The Rose Centers for Aging Well (RCAW) are the senior center component of the Benjamin Rose Institute on Aging services that support older adults and families in Cleveland, Ohio. RCAW clients that attended either the Ernest J. Bohn Center or Paul Alandt Lakeshore Center were targeted for this first implementation of the program.

Table 2. Heart Health Program: session objectives

Session title	Session objectives
Basics of heart health	<ul style="list-style-type: none"> • Understand the basics and importance of the heart and how it functions; • Know six risk factors of heart disease and identify which can be modified to prevent heart disease and which cannot; • Choose at least one individually formulated action step related to the session content.
Problems, signs and symptoms	<ul style="list-style-type: none"> • Know warning signs of heart attack in men and women; • Understand reasons people delay getting help when they are having a heart attack; • Understand the need to act fast and have a plan if they should experience symptoms; • Choose at least one individually formulated action step related to the session content.
Lifestyle choices	<ul style="list-style-type: none"> • Understand benefits of physical activity and exercise on their heart and overall health; • Understand how to start or slowly increase their physical activity; • Understand how diet, nutrition, and alcohol/tobacco consumption affect heart health; • Understand how to work around barriers to healthy lifestyle choices; • Choose at least one individually formulated action step related to the session content.
Proper care and heart-related conditions	<ul style="list-style-type: none"> • Understand terminology related to blood pressure and cholesterol readings; • Discuss effects of high blood pressure, high cholesterol, and diabetes on the heart, brain, and body; • Understand how to keep blood pressure, cholesterol levels, and diabetes under control; • Understand risk factors for stroke; • Choose at least one individually formulated action step related to the session content.
Stress, coping and support	<ul style="list-style-type: none"> • Understand the effect stress has on the decision to make heart healthy choices; • Understand that mental and emotional health is as important as physical health, especially as it relates to the heart and related conditions; • Choose at least one individually formulated action step related to the session content.

Project staff, as well as the directors from the two senior centers promoted and recruited participants expressing an interest in the program. Twenty-seven older adults agreed to participate and were consented into the program after reviewing and signing a consent form approved by the Institutional Review Board of the Benjamin Rose Institute. Immediately following the consent process, participants completed the baseline (T1) interview.

Measures

Program participants completed two structured interviews. The baseline interview took place approximately a week prior to the start of the program, and the follow-up (T2) interview was

completed three months after the program concluded. The in-person interviews were conducted by trained research staff from the Benjamin Rose Institute. In addition to demographic information, program participants were asked questions concerning their perceptions of their current overall health, as well as six specific heart-related health conditions they may have or could develop later in life. Follow-up interviews included all of the questions from the baseline interview (without demographic items), and added questions about heart health informational needs and program specific satisfaction questions.

Action steps

One of the major components of the Heart Health Program was the creation of action steps by program

participants with the help of the Session Leader. Program participants were encouraged to choose action steps during each Heart Health session, and the CCIS was used to track the progress of action steps. During subsequent sessions, a participant could select additional action steps as well as discuss progress or any potential barriers to accomplishing action steps with the group or individually with the Session Leader. In addition to tracking the progress of action steps during the program, the CCIS was also utilized to categorize the progression of action steps into one of seven statuses. The status 'to be accomplished' was assigned to any new action step the participant addressed. Because the end of the program was used as a cutoff, if an action step was still assigned the status of 'to be accomplished', it was re-coded as 'not accomplished'. An action step that the participant said they did not or could not do was also assigned the status 'not accomplished'. Action steps received the status of 'extended' if the participant once initiated it as a goal and was unsuccessful at the time, but reintroduced the previously unsuccessful action step to attempt the behavior again, aiming to complete it. An action step was 're-instated/continued' if a participant had previously made this behavior an action step, but was planning to add on to the behavior (e.g., extending a goal of walking by an additional 5 minutes each day). As with 'reinstated/continued', an 'ongoing' action step was a behavior that a participant had already listed as an action step and still does regularly, but was not going to add any more (e.g., walking only 30 minutes every day). Partially completed action steps, or action steps that were changed to something more manageable, while still working toward the original goal, were considered 'modified accomplished'. 'Accomplished' was the status given to action steps when the participant reported completing the behavior.

Session Six evaluation form

At the conclusion of the last program session, a short two-page evaluation was distributed to program participants. This form quickly gauged a) the information learned during the Heart Health Program; b) overall participant satisfaction; c) willingness to recommend the program; and d) participant preferences about the Heart Health Program format

and content. This form was distributed and returned anonymously to help elicit honest responses from participants. Information gathered from these evaluations will guide future Heart Health Program implementations.

Analysis

Participant information from T1 and T2 interviews, the Session Six evaluation form, and program attendance informed the feasibility and acceptability of the Heart Health Program. Means, counts, and percentages were used to understand the appropriateness of the program in the senior center setting, and with this population of older adults. Pre-program and post-program changes in behavior, as reported by participants in the interviews, provided preliminary indications of changes related to heart health.

Codes were created to categorize the behavior change type for each action step. In order to produce codes, two members of the project team independently reviewed all 88 action steps created by program participants. Each team member then assigned an initial code (e.g., nutrition) for all action steps. Once completed, both team members compared the individually created code lists for similarities. All items of disagreement were discussed, and a final code list of action steps was created, comprising a total of seven main action step code categories (i.e., nutrition, beverage consumption, exercise, mental health, social, informational/educational, and healthy habits). This final list of action step categories was then given to a third project team member, who independently applied these codes to the 88 action steps listed by program participants. This final coding step resulted in a consensus on 87 of the 88 action step codes.

Results

Of the 27 older adults who completed the T1 interview, 25 attended program sessions, all were Black/African Americans older than 60 years of age. The majority of them reported an annual household income of less than \$19,000 USD. The following results on feasibility, acceptability, and behavior

change focus on those 25 older adults who participated in the program sessions.

Feasibility of the program

The measure of program feasibility attempts to answer whether the aspects of the program were successfully implemented. To assess whether the program was feasible to participants, the number of program sessions attended was initially examined (Table 3). Twenty-five participants attended the first session. Program completion was defined as having participants attend at least two-thirds of the program (i.e., 4 of 6 sessions), a goal that 16 participants achieved. Five participants succeeded in attending all Heart Health Program sessions. There were various reasons for participant absences from the sessions, but examples included conflicting appointments, illnesses, lunch arriving late (affecting the program because it was scheduled directly after lunch), the bus transporting seniors arriving earlier than the program ended, or participants simply wishing not to take part in the session on that day.

Table 3. Interview and session attendance

	<i>n</i>
Completed T1 interview	27
Enrolled/attended session 1	25
Completed 4 or more sessions	16
Completed T2 interview	21

During the T2 interview participants reported that they benefitted from the program. Of the 21 participants who completed the T2 interview, 20 reported still using and implementing the information learned and action steps created during the program (Table 4). Most participants (20 out of 21) expected that six months from the T2 interview, they would still be using the information and action steps learned in the program.

Acceptability of the program

As well as examining whether the Heart Health Program was feasible to participants, data were

reviewed to determine whether the program was acceptable to them. A primary component of program acceptability is program satisfaction.

Table 4. Participant agreement about ongoing use of Heart Health Program content and tools (N = 21)

	Disagree/ strongly disagree (n)	Agree (n)	Strongly agree (n)
I continue to use the heart health information I learned from the program.	1	15	5
Six months from now, I will be using the information I learned from the program.	1	18	2
I still do the action steps I made during the program.	1	16	4
The program was beneficial to me.	1	12	8

Participant-reported satisfaction with the Heart Health Program was very high, with a mean satisfaction score of 9.18 on a scale of 0–10. All program participants (100%) stated they would recommend the program to other senior center clients. Specifically, participants were satisfied with the information conveyed, the method of information delivery, the activities to increase information retention, and the social/communal aspect of the program (Table 5). Slightly fewer participants were satisfied with the information mailed to them about action steps, and the action steps in general. Future implementations of the program will explore and seek to improve all dissatisfaction with action steps.

Behavior change

One goal of this program was to encourage heart-healthy behavior; evidence of a change was expected in participants doing more heart-healthy behaviors by the close of the program. In the T1 and T2 interviews, participants reported the frequency with which they engaged in heart-healthy behavior.

Table 5. Participant Satisfaction with the Heart Health Program (N = 21)

How satisfied were you with...?	Dissatisfied/ very dissatisfied (n)	Satisfied (n)	Very satisfied (n)
The information covered during the sessions	0	8	13
The way you were given information in the sessions	0	9	12
The activities during the sessions (such as Bingo, and checking your pulse)	0	7	13
The 'action steps' part of the program	2	8	11
The way you were asked whether you did your action steps	0	11	10
The information in your folder	0	9	11
The information mailed to you with the action steps	1	8	12
Being able to talk with other people in the group about heart health	0	10	11
The Heart Health Program overall	0	9	12

Table 6 summarizes the descriptive information and changes reported by participants. Participants generally reported a decrease in unhealthy behavior in two main areas thought to be helpful in staying healthy: maintaining social relationships, and good nutrition. Interestingly, these behaviors also emerged as two of the seven action step categories identified by project team members. This connection indicates that participants were actively taking steps toward behavior change, substantiating the participants' self-report of increasing these healthy behaviors at the follow-up interview. The behaviors that stayed the same were moderate exercise, and initiating discussion with doctors about health. Behaviors the participants engaged less in, over time, were: vigorous physical activity, and discussion with a health professional specific to new or worsening problems.

It is somewhat unclear why participants reported worsening frequency of these behaviors, but future implementations will aim to address these inconsistencies.

Eighty-eight action steps were conceptualized by all twenty-five participants. Seven primary categories describing the action steps were identified: Nutrition, Beverage Consumption, Exercise, Mental Health, Social, Informational/educational, and Healthy Habits.

An action step was given the label of 'nutrition' if it was specifically related to altering the participants' diet regarding food choices (e.g., 'eat more fresh vegetables'). There were many action steps in which participants specified that they wished to alter

beverage choices (e.g., 'increasing water' or 'decreasing caffeine intake'). Because of this large number, these action steps were put into an alternative nutrition category labeled 'beverage consumption'. Action steps regarding any physical activity were labeled as 'exercise', although the action steps had varying degrees of rigor (e.g., 'walk more' or 'start using exercise room at home'). The label 'mental health' was given to action steps that aimed to increase mental hygiene, including stress reduction (e.g., 'listen to music to relieve stress'). Action steps that addressed connecting with family, friends, and organizations were given the label 'social' (e.g., 'visit family and friends I haven't seen in a while', 'get involved at church'). Action steps regarding learning and keeping track of information were grouped into the category 'informational/educational' (e.g., 'start a food journal' or 're-read my heart health information'). Lastly, action steps that addressed better routines were included in the category 'healthy habits' (e.g., 'go to my doctor regularly', 'take all my prescriptions', 'get more sleep').

The seven statuses assigned to action steps were combined to highlight completion/accomplishment, and others that indicated non-accomplishment. 'Extended', 'to be accomplished', and 'not accomplished' were combined into the 'not accomplished' status. 'Re-instated/continued', 'ongoing', 'modified accomplished', and 'accomplished' were included into the 'accomplished' status shown in Table 7. Of all 88 action steps, 63% were 'accomplished'.

Table 6. Frequency of heart healthy behaviors before and after the program (N = 21)

How often do you...?	T1			T2		
	Never (n)	Sometimes (n)	Often/ routinely (n)	Never (n)	Sometimes (n)	Often/ routinely (n)
Do vigorous physical activities (e.g., running, aerobics, or heavy yard work) for 20 or more minutes at least three times a week	7	8	6	9	5	7
Take part in leisure-time physical activities (e.g., swimming, dancing, bicycling, walking for exercise)	6	8	7	6	7	8
Eat at least 5 servings of fruits and vegetables each day	5	8	8	4	11	6
Eat whole grains and high fiber foods	3	8	10	2	10	9
Discuss your health concerns with health professionals	2	5	14	2	3	16
Tell a doctor or other health professional if you have any signs or symptoms of a new or worsening health problem	1	3	17	2	3	16
Discuss things that are important to you with close friends	5	9	7	3	12	6
Discuss things that are important to you with close family members	2	5	14	1	7	13

Table 7. Action step status by behavior category

	Action Step category						
	Nutrition	Beverage consumption	Exercise	Mental health	Social	Informational/ educational	Healthy habits
Accomplished	13	12	14	4	4	3	5
Not accomplished	5	3	17	1	4	0	3
Totals n (%)	18 (21)	15 (17)	31 (35)	5 (6)	8 (9)	3 (3)	8 (9)

Most action steps (56%) addressed a desire to introduce healthy nutrition (21%) and exercise (35%) behaviors. Unlike the other action step categories, over half of the ‘exercise’ action steps were ‘not accomplished’. The next iteration of the Heart Health Program will explore this anomaly, and implement tools to support seniors in choosing and maintaining or accomplishing ‘exercise’-focused action steps. These participant-driven action steps about nutrition, exercise, mental health, and healthy habits reflect the information taught to participants in the Heart Health

Program. Learning about the nutritional information behind foods that the population ate, understanding the necessity of having a plan when encountering symptoms of illness, learning the benefits of physical activity and a healthy diet, limiting alcohol and tobacco consumption, and stress reduction were all specific objectives of the program. These objectives are reinforced in the heart healthy action steps chosen by participants.

Conclusions

The Heart Health Program was developed in order to address the needs of an older adult, low-income, minority population who are among the individuals at highest risk of CVD and related disorders. The initial delivery of the Heart Health Program to 25 senior center attendees was a positive experience. Participants created 88 action steps towards better heart health and 55 of these action steps were accomplished (63%). In addition, 16 of the 25 participants completed at least two-thirds of the sessions. Formulation of action steps by participants were indicative that they learned information from the program and incorporated this education in their steps to introduce healthy behaviors into their daily routines. Of the 21 participants interviewed at the close of the program, 100% reported overall satisfaction with the program. Many insights were identified about the implementation of a behavior activation program within a senior center. These lessons focused on preparation, logistics, and development of favorable relationships between the project team, senior center staff, and participants. In preparation for the program, plans were made to offer incentives to the participants as a way to increase engagement. Participants received gift cards for completing surveys, snacks for attending sessions, and the chance to win a prize during sessions. Also in advance of the program, it was decided to create and implement activities that would help to engage the participants, such as 'Heart Health Bingo'. It became clear that certain logistic factors were critical to the success of the program. For example, the program was delivered in a room that was separate from the common area of the senior center, which allowed for less disruption and more private conversation. In addition, lessons were learned about using time efficiently and being flexible in delivering the program content as competing programs, life events, and other needs may take priority during routine operations at the senior center.

Finally, the importance of relationships was reinforced during the process of preparing for and delivering the Heart Health Program. The cooperation of the senior center staff in recruiting, organizing, and introducing the program was essential, as was the trusting relationship between the senior center staff and the participants. During the program sessions,

peer involvement and encouragement were important in helping other seniors to participate.

Based on the experience of the initial delivery of the Heart Health Program, plans are underway to refine the program and broaden the delivery to more older adults. Measures to revise the program curriculum are underway to strengthen and more fully integrate the behavior change component into the content of each session. An enhanced implementation manual for the Session Leader and a bound session workbook for participants are being prepared, which should be an improvement from the folders and loose handouts used in the initial delivery of the program. There are also plans to conduct the program in additional locations. By broadening the delivery of the Heart Health Program the aims are to a) include larger and more diverse participant populations; b) increase diversity in the context of organizations where the program is delivered; and c) rigorously evaluate the program's feasibility, acceptability, and impact. Longer-term goals are to conduct a randomized controlled trial (RCT) with an equivalent comparison group, and use of carefully constructed and measured outcomes in order to determine program efficacy.

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