People reducing risk and improving strength through exercise, diet, and drug adherence (PRAISEDD): a case report on long-term single site adoption

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ABSTRACT

African-American and low-income older adults have heightened risk for cardiovascular disease (CVD). Culturally and socially congruent community-based programs can promote risk-reduction behaviors, including physical activity (PA), and can demonstrate durability. The purpose was to increase lifestyle PA and promote self-management of CVD risk factors in a sample of at-risk older adults and to sustain a PA program within low-income housing. Exercise and education sessions were conducted three times/week for 12 weeks. A community champion was trained to carry on the classes thereafter, with monthly inoculation visits by a nurse and exercise trainer. Outcome measures included attendance and CVD risk factor control. This ongoing community-based program, incorporating peer leadership, inoculation visits, and self-efficacy enhancement, has been sustained for over 3 years with classes one to two times per week and routine attendance of about 12–18 residents. PRAISEDD demonstrates that a community-based PA program can be maintained using within-community leadership, periodic involvement of health care experts, and social support and self-efficacy enhancement.

KEYWORDS

Physical activity, Cardiovascular disease,
Community-based programs, African-American,
Low-income

INTRODUCTION

African-American (AA) and low-income older adults are more likely to have hypertension, to be overweight or obese, and to have diabetes than their white counterparts, placing them at heightened risk for cardiovascular disease (CVD), stroke, myocardial infarction, peripheral vascular disease, and congestive heart failure [1]. These risk factors also commonly cluster together, and in African-Americans include combinations of obesity and hypertension (18 %), obesity, hypertension and hypercholesterolemia (13 %), or obesity, hypertension, hypercholesterolemia, and diabetes (10 %) [2], all posing significant threats to cardiovascular health in a large proportion of this population.

Implications

Practice: To promote ongoing adoption, PA programs for CVD risk reduction in AA and low-income older adults should be tailored to cultural and social context, include periodic involvement of healthcare professionals, and make use of within-community leadership.

Policy: Resources should be directed toward conducive environments, administrative support, and development of community-led PA programs to reduce CVD risk in AA and low-income older adults.

Research: Larger, multisite randomized controlled trials are needed to establish the long-term effectiveness of community-led PA interventions to reduce CVD risk in AA and low-income older adults.

However, AA and low-income older adults are less likely to be aware of CVD processes and associated risk factors, and they are less likely to be exposed to or engage in CVD prevention behaviors such as regular physical activity (PA) in their daily lives [3]. Although one of the most important cardiovascular risk reduction behaviors is physical activity [1], African-Americans, women, older adults, those with obesity, and those in underserved communities are less likely than others to participate in leisure-time PA [4] as a way to reduce their CVD risk profiles.

Poor adherence to CVD prevention health behaviors is particularly prevalent among AA older adults in subsidized housing and affects their ability to age in place successfully. Given the impact of CVD on morbidity, mortality, and cost of care and the evidence that AA and low-income older adults may also be engaging in negative health behaviors, there is a critical need to establish successful, culturally and socially appropriate approaches that can eliminate negative health behaviors and decrease the risk and incidence of CVD disease among this high-risk group.

Physical activity behaviors

Evidence-based guidelines have emerged which identify interventions to prevent and manage CVD, including the recommendation for 30 min daily of moderate level PA [5,6]. However, despite evidence supporting activity behaviors as a way to control CVD risk factors, the majority of AA and low-income men and women do not participate in regular PA. PA behaviors are influenced by a mixture of environmental, personal, and social factors. A variety of barriers to PA have been reported specifically in the AA and low-income population, such as lack of tangible recommendations from health care providers; insufficient understanding of and beliefs in the benefits associated with PA behaviors; cultural, social, and physical environments that do not support positive health behaviors; individual motivation and ability to overcome barriers to engaging in CVD prevention behaviors; and limited access to care and behavior change resources.

Social factors may be particularly important in AA for promoting adherence to an exercise program [7]. For example, AA are reported to prefer group exercises compared with exercising alone at home [8], and there is rising support for the effectiveness of faith-based group exercise programs in this population [2,9–11]. Also, within a particular housing facility, individuals may be influenced by extensive friendships and social networks. Many older AA adults report that they are not aware of local neighborhood opportunities or resources for PA [12]. Other barriers to PA include weather, transportation, and personal safety concerns [13]. Some people reject walking as a feasible PA option because of safety issues in the surrounding neighborhood, and express limited interest in alternate forms of PA, such as lifting weights or Tai Chi [8]. Therefore, comprehensive approaches and relevant behavior change interventions that incorporate social networks are needed to increase the likelihood that AA and low-income older adults will initiate and adhere to CVD prevention behaviors such as PA. Community-based interventions to increase PA should not only address the personal and environmental barriers that AA and low-income individuals face when attempting to engage in the health-protective behavior of regular PA, but they also should incorporate group-style strategies to help strengthen people's confidence in their ability to change their behaviors despite perceived obstacles [14,15]. Further, the social and contextual correlates (social norms, environment, social networks, and organizational support) influencing the adoption and maintenance of regular PA among minority and underserved populations must also be considered [16]. Finally, in order to impact cardiovascular risk, a PA program must be sustainable over time, disseminated across the population at risk, and incorporated into the culture and routines of the group.

Community-based exercise program

We report on an example of an ongoing multimodal community-based exercise program entitled “People Reducing Risk and Improving Strength through Exercise, Diet, and Drug Adherence” (PRAISEDD). The PRAISEDD program began as a 12-week exercise intervention pilot study. Based on the social-ecological model, the program was designed deliberately to reduce barriers to PA and to integrate within the living environment of at-risk AA and low-income older adults. Social cognitive theory was applied to structure behavioral change strategies such as developing individualized goals, defining barriers and identifying actions to overcome them, vicarious and modeling behaviors, and ongoing feedback. The program has now been sustained for more than 3 years. PRAISEDD stands as an example of long-term single-site adoption of a PA program that successfully addresses personal and environmental obstacles, utilizes a group-style exercise model with a community leader, and is responsive to the social and cultural milieu.

The goals of the PRAISEDD program are to increase lifestyle PA and to promote ongoing self-management of cardiovascular disease risk factors. PRAISEDD is conducted in communal multipurpose space within a senior apartment building in which AA, at-risk, and socio-economically-disadvantaged older adults reside. Because the program occurs at the residence, obstacles such as transportation and neighborhood safety concerns are removed. The PRAISEDD program directly addresses some key issues limiting PA in this population, and includes on-site progressive group exercise, education, self-efficacy enhancement, and the development of within-community leadership. By bringing this specific exercise program into these older adults' living environment and building in a structure of peer support, we can demonstrate not only the effectiveness of a low-cost physical activity program, but also its behavioral effects, its diffusion across the population at risk, and its independent sustainability within the community.

METHODS

The PRAISEDD study was approved by the University of Maryland Institutional Review Board, and continues to be conducted in a modified extended form after the completion of the initial pilot study. Potential participants provided their consent to take part in the study before determining eligibility. The initial pilot work entailed a single-group repeated measures design, evaluating descriptive data, functional measures, and survey instruments. Outcome testing was completed at baseline and immediately after a 12-week exercise intervention [17]. Under ongoing community leadership and with intermittent inoculation visits by a nurse and exercise trainer, PRAISEDD continued with measures shift-

ing from individual outcomes toward those of programmatic evaluation.

Sample

As previously reported [17], the initial pilot study sample had restrictive inclusion/exclusion criteria, including being 65 years of age or older, reading or writing English, passing a cognitive screening test and an evaluation to sign consent, and having known or self-reported CVD risk factors such as hypertension, dyslipidemia, diabetes, obesity, and inactivity. Subjects were excluded if they already exercised more than 30 min daily, or if they were unable to meet any of the inclusion criteria. However, as PRAISEDD evolved into the ongoing community-led phase, eligibility opened to any resident of the housing site, yielding a sample of about 90 % African-American, predominately women, all low-income, and all 55 years of age or older. The usual attendants at the ongoing sessions represented about 15 % of the total residents in the building.

Overview: Intervention

PRAISEDD began as a 12-week pilot study to evaluate the feasibility of implementing a CVD risk reduction program in an inner-city, low-income senior housing site. Built as Section 8 subsidized housing for individuals 62 years of age and older or those with disabilities, this seven-story site contains 110 individual apartment units, with about 150 total residents living independently. The intervention consisted of group exercises three times a week for an hour, targeted to increase aerobic conditioning, improve balance, promote stable walking patterns, and enhance obstacle navigation. The classes were initially led by an advanced practice nurse and an exercise trainer.

The first week focused on general education about CVD, motivational interventions (e.g., verbal encouragement, goal development), and discussions about ways to overcome barriers associated with adherence to CVD prevention and maintenance behaviors. Education was provided by advanced practice nurses. The first session focused on exercise to reduce CVD risk factors, the second session focused on healthy diet for CVD prevention, and the third session reviewed medication management of hypertension and hyperlipidemia. At the end of the first week, the research team assisted each participant to identify a behavior change goal related to exercise, diet, and medication adherence. Subsequent exercise class sessions consisted of a series of seated and standing stretches, followed by balance and stepping activities, aerobic dance moves to music, and a final cool down.

In addition to the PA components, we focused on health education, including developing awareness of the importance of controlling such conditions as hypertension and diabetes, and confronting barriers to ongoing self-management. At each visit during

the active intervention, we measured blood pressure, checked blood glucose, tracked progress toward individually defined goals, and provided individual and group education about diet, exercise, and medications.

RESULTS

Outcome measures

As we have reported [17], the initial 12-week pilot study produced decreases in systolic ($p=0.02$) and diastolic blood pressure ($p=0.01$) and a trend toward improvement in dietary cholesterol intake ($p=0.09$) but no changes in time spent in moderate-level physical activity, sodium intake, medication adherence, or self-efficacy and outcome expectations. Since the time of that analysis, we continued the program under leadership of the community champion and monthly inoculation visits by the research team.

Transition to community leadership

After the initial 12-week training phase, we phased our visit frequency to once weekly, concurrently training a champion from within the site to lead exercise classes when our research team was not present. A champion is characterized as a charismatic individual who strongly endorses the activity, overcoming indifference and resistance among the group. Our community champion emerged naturally in the early weeks of the study as an individual with interest in and commitment to the exercise classes. The champion was an older African-American male who was a long-time resident of the building. We identified this champion based on demonstrated behaviors, such as arriving early and attending all sessions, voluntarily setting up the room, distributing flyers, and verbally encouraging other residents to join the class. The champion received individual education and performed return demonstrations of the specific exercises, and also was given recorded music with cues for the ongoing classes. Since that time (24 months ago), the community champion has continued to lead and facilitate exercise classes independently one to two times per week, with routine attendance of about 12–18 residents. The community champion communicated with the investigative team at each inoculation visit, reporting attendance and interests of the group.

Inoculation

After the formal 12-week pilot program ended, we returned for monthly inoculation visits for CVD risk monitoring, exercise progression, and health education. Working with the community champion, we targeted specific health issues or concerns, and continued to reinforce education about self-management. We obtained blood pressures, weights, and reviewed adherence to medication and health

behaviors related to CVD risk reduction such as adherence to heart healthy diets. Health monitoring data were provided in writing to each participant for use in self-tracking and for communicating with primary care providers. The exercises were reviewed and progressed to higher intensity or more repetitions. Variations in music and types of exercises were expanded to increase the elements of fun and spontaneity, such as incorporating salsa and swing dancing steps. Positive health behaviors were praised, and strategies to reduce obstacles to daily PA were developed to suit individual needs. We are currently continuing these inoculation visits, and are following the programmatic outcomes related to adoption and dissemination.

Adoption and dissemination

Despite competing activities in the community and changes in housing management, PRAISEDD classes were encouraged and supported by administration and continued to be held regularly with ongoing participant attendance ranging from 8–21, with variations in the group composition. Because the ongoing adoption of this program was predicated on being open to any interested resident, we expected that there would be some who regularly attended, while others were more sporadic. To disseminate the program to a wider segment of the population, we enlisted the community champion to personally invite residents to participate, and we also provided posters, flyers, and verbal information about the classes. Participants periodically received small incentive gifts, such as pedometers, lunch bags, and pens that clearly and visibly identified them with the PRAISEDD project.

DISCUSSION

While structured exercise and education programs can produce clinically meaningful physiologic changes in individuals with CVD risk in the short run, the translation of such improvements into everyday PA behaviors is a key to promoting long term health and reducing CVD morbidity and mortality. For optimal long-term effects in populations at risk, we need to disseminate straightforward community-based PA interventions that provide ongoing support and within-community leadership for increasing and maintaining participation [18]. PRAISEDD demonstrates that four components are essential to sustaining a PA program in a community of AA and low-income older adults with CVD risk: (1) within-community peer leadership, (2) periodic input and reinforcement by health care professionals; (3) group reinforcement of PA behaviors; and (4) getting administrative support and fitting the activity into the environment.

As the PRAISEDD project has affirmed, training a community champion is a feasible and successful model for sustaining a PA program in a community of AA and low-income older adults. Widespread

dissemination of this kind of program could have significant public health implications for increasing PA participation by older adults at particularly high risk for CVD [19]. In addition to physically leading the exercise sessions, the community champion as been instrumental in keeping the program going by consistently encouraging others to participate, setting up the room, and personally delivering promotional flyers. The champion model may help to enhance long-term maintenance of physical activity gains from this community-based intervention. This integral approach has great potential to be adapted and delivered inexpensively in other community settings [20].

Periodic inoculation visits by a nurse and exercise trainer were not only useful in maintaining adherence to the PRAISEDD program and classes but also for positive modeling and reinforcement of health behaviors. At each visit, participants received blood pressure and blood glucose measurements if appropriate, discussion of their medications and diet practices, and individualized health counseling. Such feedback carried great importance with the participants, as indicated by their attendance prior to the class start time, the tracking of their blood pressure and blood glucose readings on their individual calendars, and their collections of small incentive gifts received from the research team.

Finally, it is important to appreciate the contribution of social and self-efficacy components to ongoing participation in the PRAISEDD program. As related research has reported, people who stay with PA programs over time have strategies they use to sustain their exercise behaviors [21]. Some of our participants enjoy acting as a role model to others. Some see the classes as an avenue for social support and a way to reduce isolation. Others are eager to set and attain personal goals. Any of these strategies can be strengthened with specific self-efficacy enhancing interventions. Programs that only address barriers to exercise may not be successful unless coupled with facilitators that promote maintenance, such as those that increase self-efficacy for exercise [21].

Clinical implications

PRAISEDD is an example of a simple, low-cost PA program tailored to a specific cultural and social context, which has implications for expansion to other at-risk populations. The program uses very few resources and there have been no study-related adverse events. Locating the classes within flexible space at the residence eliminates several barriers to participation. The community champion role can be applied in other settings, and may be instrumental in assuring congruence with cultural and social values among the group.

Limitations

The PRAISEDD study is limited by its small sample size, and its tie to a specific residence, which may

affect generalizability to the greater population of AA and low-income older adults. It is also important to consider that the study is ongoing, and while its durability is substantial, all programmatic outcomes are not yet known.

Future directions

As we move forward with PRAISEDD, we will determine the proportion and representativeness of the population targeted by the intervention (i.e., who was eligible and who actually participated); efficacy/effectiveness, or the extent to which the intervention improved outcomes of participants; treatment fidelity or evidence that the intervention can be implemented as intended in a variety of settings; and we will continue to follow the long-term adherence to the intervention. Our exploration of the diffusion process will be done using a program evaluation/focus group approach, through which all residents will be invited to talk about their experiences in attending, or reasons for not attending, our PRAISEDD project activities (education and exercise classes over the past year).

By bringing this specific exercise program to at-risk older adults' living environments and building in a structure of peer support, we have the opportunity to determine the effectiveness of a low-cost self-run activity program and also its behavioral effects and its dissemination and independent sustainability within the community. We need to be able to test this model using a randomized controlled design with a larger sample, in multiple sites, and over a longer follow-up period with considered measures to reflect changes in individual lifestyle activity behaviors and the program's reach into the community at risk.

Further, there is a need to extend effective programs beyond individuals; traditional face-to-face intervention modalities have limited impact if they cannot be delivered consistently to large segments of the target population. Based on robust research evidence, environmental and policy changes that influence CVD prevention behaviors and incorporate social networking will be critical to the diffusion of PA behaviors [17]. The goal is to apply the most effective programs and to make PA readily available and sustainable so as to reach the greatest number of at-risk older adults, and to keep the programs going independently over time, with their success ultimately leading to wider dissemination and long-term adherence to exercise and lifestyle PA among minority and low-income older adults.

Conclusion

PRAISEDD demonstrates that a community-based PA program can be sustained for years if it includes culturally and socially responsive within-community

leadership, periodic involvement of health care experts, and elements of social support and self-efficacy enhancement.

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