The Gerontologist
Vol. 51, No. S1, S73–S81
doi:10.1093/geront/gnr001

© The Author 2011. Published by Oxford University Press on behalf of The Gerontological Society of America.
All rights reserved. For permissions, please e-mail: journals.permissions@oup.com.

Recruitment and Retention Strategies Among Older African American Women Enrolled in an Exercise Study at a PACE Program

Eileen M. Sullivan-Marx, PhD,[1] Kathleen K. Mangione, PhD, PT,*,[2] Theimann Ackerson, MSSW,[1] Ingrid Sidorov, MSN,[1] Greg Maislin, MS, MA,[3] Stella L. Volpe, PhD, RD,[4] and Rebecca Craik, PhD, PT[2]

[1]Department of Family & Community Health, University of Pennsylvania School of Nursing, Philadelphia.
[2]Department of Physical Therapy, Arcadia University, Glenside, Pennsylvania.
[3]Biomedical Statistical Consulting, Inc., Wynnewood, Pennsylvania.
[4]Department of Nutrition Sciences, Drexel University College of Nursing and Health Professions, Philadelphia, Pennsylvania.

*Address correspondence to Eileen M. Sullivan-Marx, PhD, University of Pennsylvania, 418 Curie Blvd., Philadelphia, PA 19104-4217. E-mail: marx@nursing.upenn.edu

Received June 20, 2010; Accepted January 3, 2011
Decision Editor: Anna M. Nápoles, PhD, MPH

Purpose: This study examined employment of specific recruitment and retention strategies in a study evaluating outcomes of a moderate activity exercise program for older African American women with functional impairments attending a Program for All-Inclusive Care of Elders (PACE). ***Design and Methods:*** Recruitment and retention strategies focused on (1) partnership between researchers and participants, (2) partnership between researchers and clinicians, (3) overcoming administrative issues, and (4) reducing burden on clinicians and participants. The exercise protocol consisted of strength and endurance activity 2 to 3 times per week for 16 weeks. ***Results:*** Fifty-two African American women (61.2% of target) were enrolled and 37 (71.2%) completed the 16-week exercise program. Fifteen did not complete due to non-descript reasons and/or preference for other program activities (n = 11), medical problems (n = 2), or need for physical therapy (n = 2). ***Implications:*** Success in recruitment and retention included use of a PACE program, hiring an advanced practice nurse to improve retention, and integration with site activities and sustaining the exercise program at the site. Challenges for recruitment and retention remain to engage older, frail adults in exercise as a life habit, and availability of time and place to do so.

Keywords: Minority, Function, Community-dwelling

Although evidence suggests that community-dwelling older adults at risk for health problems benefit from structured programs of exercise, there is a need for more understanding regarding ways that evidence can be translated to clinical programs and incorporated into systems of care for all older adults of racial and ethnic groups. Simonsick notes in an editorial that " . . . we should seriously consider new strategies for reaching out to the frailest and sickest segment of the older population" (Ferrucci & Simonsick, 2006, p. 1154) and that "the good news . . . about the health benefits of exercise must transcend the scientific community and be disseminated to policymakers and health care planners" (p. 1155). Moreover, frail functionally impaired older adults from minority groups have not been fully studied due to difficulties in recruitment and retention of participants and concerns about monitoring health status during moderate activity exercise (Areán, Alvidrez, Nery, Estes, & Linkins, 2003; Robinson & Trochim, 2007).

Studies of exercise programs that are designed for older adults who independently live in communities may not be sufficient, however, to understand exercise benefits for African American older women with impairment in instrumental activities of daily living or with chronic illness (Ferrucci & Simonsick, 2006; Smedley, Stith, & Nelson, 2003). Exercise has been demonstrated to improve physical function in older adults (Brach, Simonsick, Kritchevesky, Yaffe, & Newman, 2004) and among those with functional limitations (Topp, Boardley, Morgan, Fahlman, & McNevin, 2005); yet, implementation of a programs of exercise for older adults with different racial ethnic origins living in urban environments who also have chronic illness and are eligible for nursing home level of care is not sufficiently addressed (Levkoff & Sanchez, 2003; Smedley, Stith, & Nelson, 2003; Stewart et al., 2001; Tan, Lui, Eng, Jha, & Covinsky, 2003).

Attention has been drawn in the last decade to the need to include ethnic minority groups in aging studies so that the field of aging can grow further (Brown & Alexander, 2004; Paskett et al., 2008). A clear commitment by researchers to achieve minority enrollment and retention targets, combined with strategies and modifications to meet these targets, has led to better success rates (Williams & Corbie-Smith, 2006). Approaches that have been shown to improve recruitment and retention of minorities fall into several categories: (a) eliminating research administrative barriers, (b) development of community-based participation in all aspects of the research process, (c) communication strategies, (d) commitment of researchers to target enrollment of minorities, and (e) resources to implement strategies aimed at minority enrollment and retention (Durant et al., 2007; Paskett et al., 2008; Robinson & Trochim, 2007). Current recommendations include the use of frameworks and detailed community participatory strategies that address barriers that are administrative in nature such as funding of enrollment resources, overcoming Institutional Review Board (IRB) difficulties, addressing operational complexities between sites and research staff for access to participants and ability to conduct interventions, reducing site and participant burden, and increasing participant engagement and incentives (Paskett et al., 2008; Robinson & Trochim, 2007).

The purpose of this study was to examine the employment of specific recruitment and retention strategies in a study evaluating outcomes of a moderate activity exercise program for older African American women with functional impairments attending a Program for All-Inclusive Care of Elders (PACE). Our recruitment and retention strategies focused on principles of (a) partnership between researchers and participants, (b) partnership between researchers and clinicians, (c) overcoming administrative issues, and (d) reducing burden on clinicians and participants (Areán et al., 2003; Levkoff & Sanchez, 2003; Paskett et al., 2008; Robinson & Trochim, 2007). Based on these four principles, we developed specific strategies to foster enrollment and retain participants in the study.

Methods

Recruitment and Retention Strategies

Partnership With a PACE Model of Care.—We embedded the study in a PACE model of care in which the participants are eligible for nursing home care but live at home in their communities and attend the PACE site for health care and recreational activities. The PACE site for this study has members who are mostly African American and women. PACE programs are well integrated into communities and have garnered trust and liaisons with families and community, thus, creating a context in which facilitation of recruitment and retention might be enhanced (Mukamel et al., 2007; Tan et al., 2003). Furthermore, PACE programs provide and coordinate health and social activities such as transportation and adult day care in an interdisciplinary model eliminating some barriers prohibiting attendance in a study. Moreover, PACE provides the opportunity to monitor health conditions through trained and professional staff on site before, during, and after a moderate level of activity exercise. Having a sense of safety in the environment and support from peers and other caring individuals has been reported as key for older women in making decisions about health promotion, participation in physical activity further supporting the choice to examine exercise activity in a supportive and structured environment found in a PACE model of care (Fleury & Lee, 2006; Shearer & Fleury, 2006).

Our target enrollment group was all African American women who participated in the PACE program for the study; as members of the PACE program, these women are all eligible for nursing home level of care meaning that they have need for assistance in at least two personal activities of daily living, that is, eating, dressing, mobility, continence, and bathing. They all live in an urban community

with family or other support. Average age of the target group was 78 years, more than 90% of the members have a cardiovascular health problem, more than 80% have a musculoskeletal disorder, and 86% have mental disorders including dementia and depression. Members of the PACE program are representative of the larger community in which they live where there is a predominance of socioeconomically deprived minority individuals with increased rates of chronic illness and is largely populated by individuals who are of African American descent. African American older adults in this area are more likely than Whites to rate their health as fair/poor; in the community from which PACE members are drawn, those aged 75 years or older are African American (64%), 71% have no more than a high school education, 77% are women, and 48% report an income of less than $15,000 annually (Sullivan-Marx, Cuesta, & Radcliffe, 2008).

Partnership With Council of Elders at PACE.—Prior to the study, African American women who were members of the PACE program's Council of Elders approached staff and faculty researchers associated with the program requesting more exercise activities and stating that they were supportive of a study that would lead to understanding benefits of the exercise. Because exercise programs are known to improve quality of life but need to be implemented and sustained for frail older adults, researchers then worked with the Council of Elders to initiate and design this study. They also advised on scheduling issues, eligibility criteria, and methods to recruit participants, such as flyer design and recommending face-to-face meetings. The Council of Elders volunteered to provide encouragement to the staff and study participants by discussing the importance of exercise at their monthly meetings, identifying the exercise study on activity calendars in the program, and highlighting benefits of exercise activities when speaking with the community and visitors to the program.

Integration With PACE Schedule.—The research team met weekly with relevant clinical staff to conduct the exercise project. It became clear as the weekly meetings continued that not all PACE staff could attend weekly meetings and some newly hired PACE professional staff had limited investment in the exercise program due to programmatic responsibilities. At the outset of the study, some of the PACE key staff considered the exercise as a separate activity rather than an integrated PACE activity. This resulted in initial low enrollment and limited attendance below target numbers set by the researchers. To improve recruitment, attendance, and integration with the PACE program, the project team raised the question: How can the exercise program be better integrated with the program activities? All agreed that one way to have better enrollment and attendance was to be more integrated into the PACE schedule and activities as well as to coordinate members' schedules for health appointments and care.

A bridge team that included staff, researchers, and Council of Elder members was then established to focus on integration of the project with daily operations in the program. The bridge team met twice a month for approximately 30 min. When key problems arose, such as a member who was not attending the overall PACE program which also limited attendance at exercise, relevant PACE staff and project team members would have brief (<10 min) "huddle" meetings to address the reason why an individual member was not attending the PACE program and align the participant's schedule to attend the PACE program at the time of the exercise.

Pretest of Site Data Collection.—When participants arrived at the facility, they routinely attended a number of events including meals, recreational activities, primary care and nursing visits, and other health activities. This limited the time available to collect baseline, daily, and end point data to monitor participants and determine improvement. To ensure that the data collection could be completed efficaciously and in a quality manner, the measurements were pretested at various locations and times, then the best location and set time were determined, and implemented using the bridge team to support the baseline, daily, and end point measurement collection.

Research Team Advanced Practice Nurse Role.—After initial slow enrollment and attendance of the exercise sessions in the first few months of the study due to coordination problems, such as member attendance at site activities compared with the exercise session, an advanced practice nurse was employed by the research team to be a liaison between the exercise project team and the health care staff, to monitor participants' health

during exercise, assist with prioritization of a participant's needs, and to problem solve with the participant and staff to improve attendance in the exercise sessions. The Advanced Practice Nurse (APN) worked closely with staff at the site to ensure that participants arrived on time for daily assessment and participation in the exercise. The APN facilitated retention by monitoring participants' health conditions with the clinical staff and established strong relationships with the participants to identify satisfaction and elicit suggestions for improvement of the exercise. If a participant developed discomfort, the APN worked with clinical staff to relieve pain and maintain enrollment. This was accomplished on an individual basis with each enrollee as a need arose to ensure retention and participation of the enrollee.

Enhancing Administrative Resources.—Resources to address recruitment and retention are often limited in funded studies. We partnered with the clinical PACE program to provide in-kind nursing assistants who were then trained by researchers to lead the exercise group for 2 hr/day, three days per week. We included the nursing assistants as research team members and provided vests with an "Exercise for LIFE" logo to them. Senior leadership in the program was supportive in several ways: (a) valuing the exercise study in weekly meetings, (b) acknowledging the exercise study as a core component of the mission of the program, (c) encouraging and expecting clinical and recreational activity staff to partner with the research team, and (d) providing space, logistical support through scheduling of member's time to attend the sessions.

Gaining consent was facilitated through use of the PACE site communication system to their members and families. The principal investigator worked closely with the IRB to ensure that enrolling persons of extreme age who had multiple illnesses and functional impairment could be included to expand eligibility criteria. The presence of clinical staff and an APN during the exercise facilitated assurances for safety to the IRB review board, families, participants, and clinical staff who might have been reluctant to enable participation.

Plans for Sustainability of Exercise.—Because the initial impetus of the exercise study was to develop a program of moderate activity exercise that could be sustained at the PACE site, integration of Council of Elders, clinical staff, and program administrators with the exercise study was key. Knowing that the program would ultimately be well tested and a benefit to those in their program as well as other PACE sites provided a strong incentive for participants and staff to become engaged and feel "special." Indeed, the participants labeled the program initially as "Special Exercise." When participants completed the sixteen-week posttest period, the program was then titled "Exercise of LIFE" and embossed on visors and vests worn by participants.

Sample and Setting

The setting for this study was a PACE program affiliated with an academic institution in a large metropolitan Northeastern city that has a predominance of socioeconomically deprived minority individuals with increased rates of chronic illness and is largely populated by individuals who are of African American descent (non-Hispanic Black). PACE are funded by Medicare and Medicaid using a capitation financing basis; this model of care provides community-based care for older adults and for their families who otherwise would require institutionally based long-term care services. PACE programs promote independence at the highest levels of functioning while allowing choice and dignity for members and their families. PACE provides all needed preventive, primary, acute, and long-term health care services in an older day center environment so that eligible older individuals continue to live in their homes as long as possible. Services are determined by the PACE interdisciplinary care team that is centered on the older adult with family participation. Rehabilitation, prevention, and primary care services are approved by the team and not impeded by fee for service payment methods. Collaboration among physical and occupational therapists, recreational and activity professionals, and nursing personnel to provide structured exercise and focused rehabilitation interventions is enhanced. An average schedule for a PACE member is to attend a PACE center two to three days per week for approximately 5–6 hr. During that time, members receive two meals and attend recreational activities. In addition, they are provided with personal care needs as well as receiving on site health care, including primary and specialty care, and rehabilitation and behavioral health services. Transportation is provided by the PACE program for attendance at the PACE

center and related health appointments, including dentistry (Mukamel et al., 2007).

At the start of the study, the PACE program had 291 members with a mean age of 78, of whom 76% were women, 97% were African American, 87.5% who met Medicaid eligibility, and 90% attended the day care center. All African American women who were members of the PACE program, were able to ambulate at least 50 feet, and attended the day care center were eligible for the study. Members with severe dementia (Mini-Mental State Examination [MMSE] < 10) did not participate in day care center activities and were thus excluded. Cognition was measured by the MMSE. This 30-items screening tool examines general cognitive function. A full score is 30, indicates intact cognitive functioning state; a score of 23 or less indicates cognitive impairment (Folstein, Folstein, & McHugh, 1975). We also assessed each participant's comorbidity status and independence in activities of daily living. Comorbidity was measured using the Charlson CoMorbidity Scale to determine physical health status using health record review; higher scores indicate higher morbidity (Charlson, Pompei, Ales, & MacKenzie, 1987). Activity of daily living was assessed using the Katz's Activities of Daily Living, which assesses level of independence in activities of daily living. Items are rated on a scale of 0 = *independent* to 4 = *needs assistance of a person*. Range of the scores is 0–20 (Katz, 1983).

We targeted an enrollment of 85 participants for the study. The pool of eligible participants was 191 persons. From a list of eligible participants, we used randomization tables to select a pool of 25 participants at eight-week intervals for rolling enrollment to keep a maximum of 15 persons per exercise group at any given time. Those with a medical contraindication to perform the exercise by judgment of the PACE, primary care providers were excluded but we did not a priori exclude participants based on medical diagnosis. In addition, we screened participants for depression, pain, and sleep problems to determine if these would interfere with exercise outcomes, but no enrollee had clinically significant problems in depression, pain, or sleep at outset. Pain was assessed using the SF-36 question, How much bodily pain have you had during the past 4 weeks? Answers are rated on a Likert scale of 1 = *none* to 5 = *extreme or severe* (Ware & Sherbourne, 1992). Depression measured by Geriatric Depression Scale, the maximum score, is 30 with a higher score indicating depressive state. A score of 11 or higher indicates depression (Yesavage et al., 1983).

Prior to participation, each participant read and signed an informed consent form. A complete exercise protocol consisted of two to three times per week over sixteen weeks or 48 sessions. Initially, we planned to enroll 85 participants; however, timeline of the study and space considerations, including a relocation of the PACE site during the first four months of the study, limited use of the use of multiple groups enrollment as was originally planned. Therefore, at conclusion of the study, we had a total of 52 enrollees. The project was approved by an IRB.

Procedure and Data Collection

Demographic characteristics of age, gender, race, marital status, and education were obtained from clinical records by a trained research assistant. The exercise program was designed at a moderate level of activity to improve strength, balance, and endurance (Guralnik, Ferrucci, Simonsick, Salive, & Wallace, 1995; Wolinsky et al., 2007), however, pilot work at the site showed that the participants were unable to perform any single task with enough duration to be physiologically demanding. To reduce initial participant burden, the exercise program was divided into intervals to enhance recruitment and retention. Three 5-min walking intervals were interspersed with two strength and balance intervals. The program was held 5 days/week for 16 weeks; sessions initially lasted 30 min and extended to 50-min sessions (excluding setup and vital signs measurement). It was planned that participants would attend three times per week. A health care professional supervised each session with two nursing assistant caregivers leading the exercises.

The program began with a 3-min warm up followed by an activity phase consisting of 5-min walking intervals followed by 3 min of standing lower extremity exercises, such as hip flexion, extension, and abduction. A walking interval followed and the next set of exercises were sitting knee extension exercises with cuff weights, standing heel raises, and standing chair squats. The program ended with another walking interval and a cool down of deep breathing and gentle active range of motion. Completion of the exercise program was considered to be at sixteen

weeks or 48 sessions. Attendance was logged by project staff.

Measurement of Satisfaction

To assess satisfaction with the program, we asked participants two questions: How satisfied were you with the exercise program? and how satisfied were you with the trainer for the exercise program? Each question was rated on a 4-point Likert scale ranging from *highly satisfied* to *dissatisfied*.

Data Analysis

Success of retention and recruitment strategies was examined bi-weekly by the research and the clinical "bridge" team. Analysis of recruitment and retention outcomes consisted of descriptive statistics of participant characteristics.

Results

Retention and Recruitment

Fifty-two participants enrolled in the study. This was 61.2% of our original enrollment target. Of the 52 enrollees, 37 (71.2%) completed sixteen weeks or 48 sessions at end point of the exercise study. Therefore, the final sample consisted of 37 African American women. The attendance rate of the 37 participants for at least three times per week was 47.8% (*SD* = 18.8), attendance rate at two times per week was 70.7% for the 37 participants. Fifteen (28.8%) did not reach end point at sixteen weeks for data analysis due to refusal to continue and/or preference for other program activities (*n* = 11), medical problems that interfered with continuation with the exercise program (*n* = 2), or need for intensive physical therapy (*n* = 2). We examined differences in patient characteristics at baseline between noncompleters and completers including age, comorbidity, activities of daily living, cognition, pain, and depression (Table 1). Noncompleters had higher scores on the depression scale than the completers, however, scores in either group did not indicate the presence of depression. Noncompleters and completers did not differ significantly on any other characteristic (Table 1). Most of the completers had had a high school education (51.4%) or greater and were widowed (67.6%), and all were Medicaid recipients. Participants had two or more chronic conditions, limitations in activities of daily living, and mild cognitive impairment, and all were Medicaid recipients (Table 1).

Table 1. Characteristics of Noncompleters Versus Completers of Exercise Study (*N* = 52)

	Noncompleters (*n* = 15)	Completers (*n* = 37)	*p* Value[a]
	n (%)	*n* (%)	
Female	15 (100)	37 (100)	—
African American	15 (100)	37 (100)	—
	M (*SD*)	*M* (*SD*)	
Age	80.4 (9.0)	77.7 (8.9)	.284
Comorbidity	3.4 (2.5)	2.9 (1.8)	.366
Activity of daily living independence	10.4 (10.8)	14 .0 (16.2)	.382
Cognition	22.6 (6.0)	22.7 (6.6)	.957
Pain interference	2.3 (1.3)	2.1 (1.2)	.612
Depression	7.7 (5.6)	4.0 (3.7)	.004

[a] *t* Test.

Using a PACE site as a partner was successful to enroll minority older women who were fragile and had functional impairments. The availability of clinical staff on site reassured enrollees about addressing potential negative consequences of the exercise intervention in a frail group, enhanced attendance through transportation, and provided a small environment to spread interest in enrollment in the activity. However, two overarching factors remained a barrier to enrollment and retention: (a) limited time that older adults had on site to participate in meals, health appointments, and other social and recreational activities of interest which pulled them away from exercise and (b) loss of interest in completing a sixteen-week exercise activity by participants, many of whom had a limited attention span and were mildly to moderately cognitively impaired.

Partnership with the researchers and clinical staff weekly had some effectiveness to address these barriers. Although transportation was provided to attend the facility, attendance on site and transportation schedules were under the control of the program, our work with the team to coordinate attendance and transportation with the exercise activity led to increased numbers of participants able to attend three times per week but most still attended twice per week. Partnership with the researchers and participants including the Council of Elders was successful to highlight the importance of exercise as a daily activity and ensure satisfaction with the program. Based on field notes of

the research staff, members of the Council of Elders regularly visited the exercise program and also were observed encouraging members and supporting participants. Minutes of the Council of Elders meetings reflected that the exercise study was a priority for the group and was discussed at routine intervals. The support of these key community leaders created an atmosphere in which the exercise research was valued as a member-driven program and a partnership with the researchers. When potential participants were approached about enrolling the study, they usually expressed a positive regard for the study because of benefit to members. Based on our field notes, no person expressed reason to decline enrollment due to a reluctance to be studied.

To address administrative issues, a significant amount of resources were used by the research team and the site including hiring an advanced practice nurse on the research team, in-kind support of two site caregivers, space to conduct the exercise, and frequent team meetings to address retention. This proved effective to integrate the research activity with the site schedule of activities and to monitor the frailty of the participants. The advanced practice nurse worked daily with the primary care providers, nurses on site, and physical therapists to ensure that participants were free of pain, rested, and motivated to exercise. IRB, consent issues, and communication were easily addressed because the site had a system in place for these issues.

Burden on participants and clinicians were reduced in this study yet retention remained a major issue. The exercise protocol was initially altered to meet the baseline abilities of the participants. Participants progressed well in the exercise protocol, most enthusiastically; however, others declined to continue from lost interest in the exercise. We had success in reducing clinical staff burden by adding an APN to the research team and pretesting data collection so that it did not interfere with staff responsibilities. Engagement by staff and Council of Elders led to sustaining the program as a permanent program following the study.

Satisfaction Outcomes

Participants reported high satisfaction with the program and the exercise program staff leaders. Typical member statements in the exercise program were "Come and get me everyday—don't let me say no! I need to exercise," "This makes me feel good," and "I'm losing weight!! That's great." Anecdotally, PACE staff and Council of Elder members noted that participants were "steadier" when they walked and participants had better moods and were using canes rather than walkers. There was a sense of trust that grew between the participants and exercise researchers noted by APN in her field notes that participants shared personal stories and family photos with her and other research staff during the study. Staff noted that participants in the group looked out for another and formed relationships outside of the exercise program.

Discussion

Bringing health promotion to fragile older adult women of African American descent requires a systematic team approach that includes rigorous processes and evaluation to develop, implement, and sustain change. The process of social change, particularly in complex organizations, is fraught with difficulties that are both systematic and human (Rogers, 2003). Moreover, attending to the influence of the social and environmental context on physical activity for women in this group is important to consider (Fleury & Lee, 2006), for example, completers in this study had a somewhat greater level of education than the mean educational level for older African Americans in the urban area where the study was located, this warrants further study. Despite systematic and integrative approaches based on principles used for recruitment and retention of minorities and frail older adults, we attained only 61.2% of our initial enrollment target. Our initial target may have not been realistic given the frailty of the clientele and schedule of site attendance and activities. Those who did not complete the exercise study did score higher in Geriatric Depression Scale, although within normal limits than the completers. Whether a depressed mood contributed to motivation to continue in the study or a correlate with other factors is not known but should be addressed in future studies to improve retention (Everson-Rose et al., 2005).

Paskett and colleagues (2008) note that recruitment goals in their study ranged from 52% to 184% and varied due to a myriad of barriers including administrative and community partnership issues. While we attempted to address these, we did not, for the purpose of this study, develop an intervention based on behavioral motivation to

value and participate in exercise. Some studies have indicated that women may prefer exercise in social groups, which we did in this study; however, the women in our group at times preferred other social group activities on site and did not want to forego those for the total duration of the sixteen-week study (Jerome et al., 2006; Murrock & Gary, 2008) which mitigated against retention in the sixteen-week program. Future work in this area should address behavioral motivation, social, and environmental context to raise commitment to exercise among a largely sedentary group of older women with multiple illnesses and functional deficits. To this point, Shearer and Fleury (2006) noted that concepts of "connectiveness and collectivism" (p. 3) were important to older women in considering participation in health promotion activities.

A unique feature of this project for implementation and to recruit and retain participants was the use of trained staff caregiver nursing assistants and an advanced practice nurse for oversight to overcome problems with clinical staff to implement research protocols (Paskett et al., 2008; Robinson & Trochim, 2007). These providers knew the participants very well and could use their knowledge to encourage the participants to fully follow the protocol while individualizing the intensity of strength and endurance training that the participants could tolerate. Loss of enrollees due to the development of new or worsened medical conditions occurred in only two enrollees. We attribute this to the use of the PACE staff working closely with the APN and the availability of primary care providers and clinical staff who knew the participants well.

The PACE program has a culturally relevant environment and strong representation on programmatic work from the Council of Elders and community regarding ethnocentric activities and values as recommended by the Centers for Minority Aging and Health Promotion (Levkoff & Sanchez, 2003). The music and environment were chosen by the participants and therefore were relevant to the age and ethnic/cultural heritage of participants. Further study could determine if these factors make a difference in exercise for older adults.

We were encouraged that the majority of participants (over 70%) attended at least two times per week, which is the minimal frequency associated with functional gains in other exercise studies of frail older adults (Nelson et al., 2007). As noted by Paskett and colleagues (2008), resources are often limited on research teams to fully engage with clinical staff and communities to enroll and maintain retention, we were able to do so because of partnership between the researchers and the PACE program; however, the use of resources and frequent meetings was significant and may not be fully necessary on an ongoing basis. For future work, we would recommend fewer meetings and targeting elements of the resources that work using quality improvement methods.

Our study was conducted in a unique model of care that successfully provides comprehensive care but is not yet available in all states. An exception is the Northeast where several states have embraced the PACE model of care and several large urban areas have full access to a PACE model for eligible older adults. Further research in quality improvement and exercise among community-based long-term care is needed to understand methods to sustain and intervene with greater number of older adults of various racial and ethnic backgrounds.

Funding

This project is funded, in part, under a National Institute of Aging grant, Resource Center for Minority Aging Research, *Reducing Health Disparities Across the Stages of Illness in Older Minority Populations with Chronic Disease*, University of Pennsylvania, P30-AG031043; and a grant with the Pennsylvania Department of Health, Health Research Formula Fund to the University of Pennsylvania, Award 410031306. The Pennsylvania Department of Health specifically disclaims responsibility for any analyses, interpretations, or conclusions.

References

Areán, P. A., Alvidrez, J., Nery, R., Estes, C., & Linkins, K. (2003). Recruitment and retention of older minorities in mental health services research. *The Gerontologist*, *42*, 36–44.

Brach, J. S., Simonsick, E. M., Kritchevsky, S., Yaffe, K., & Newman, A. B. (2004). The association between physical function and lifestyle activity and exercise in the health, aging and body composition study. *Journal of the American Geriatrics Society*, *52*, 502–509.

Brown, D. R., & Alexander, M. (2004). Recruiting and retaining people of color in health services studies: Introduction. *Journal of Aging & Health*, *16*, 5S–8S.

Charlson, M. S., Pompei, P., Ales, K. L., & MacKenzie, C. R. (1987). A new method of classifying prognostic comorbidity in longitudinal studies: Development and validation. *Journal of Chronic Disease*, *40*, 373–383.

Durant, R. W., Davis, R. B., St. George, D. M., Willimas, I. C., Blumenthal, C., & Corbie-Smith, G. M. (2007). Participation in research studies: Factors associated with failing to meet minority recruitment goals. *Annals of Epidemiology*, *17*, 634–642.

Everson-Rose, S. A., Skarupski, K. A., Bienias, J. L., Wilson, R. S., Evans, D. A., & Mendes de Leon, C. F. (2005). Do depressive symptoms predict declines in physical performance in an elderly, biracial population? *Psychosomatic Medicine*, *67*, 609–615.

Ferrucci, L., & Simonsick, E. M. (2006). A little exercise. *Journal of Gerontology Series A: Biological Sciences and Medical Sciences*, *61*, 1154–1156.

Fleury, J., & Lee, S. M. (2006). The social ecological model and physical activity in African American women. *American Journal of Community Psychology*, *37*, 129–140.

Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). 'Mini-mental state'. A practical method for grading the cognitive status of patients for the clinician. *Journal of Psychiatric Research*, *12*, 189–198.

Guralnik, J. M., Ferrucci, L., Simonsick, E. M., Salive, M. E., & Wallace, R. B. (1995). Lower-extremity function in persons over the age of 70 years as a predictor of subsequent disability. *New England Journal of Medicine*, *332*, 556–561.

Jerome, G., Glass, T., Mielke, M., Xue, Q., Andersen, R., & Fried, L. (2006). Physical activity participation by presence and type of functional deficits in older women: The women's health and aging studies. *Journal of Gerontology*, *61A*, 1171–1176.

Katz, S. (1983). Assessing self-maintainence: Activities of daily living, mobility, and instrumental activities of daily living. *Journal of the American Geriatrics Society*, *31*, 721–727.

Levkoff, S., & Sanchez, H. (2003). Lessons learned about minority recruitment and retention from the Centers on Minority Aging and Health Promotion. *The Gerontologist*, *43*, 18–26.

Mukamel, D. B., Peterson, D. R., Temkin-Greener, H., Delavan, R., Gross, D., Kunitz, S. J., et al. (2007). Program characteristics and enrollees' outcomes in the Program for All-Inclusive Care of the Elderly (PACE). *The Milbank Quarterly*, *85*, 499–531.

Murrock, C. J., & Gary, F. A. (2008). Culturally-specific dance to increase functional capacity in African-American women. *Journal of Cultural Diversity*, *15*, 168–173.

Nelson, M. E., Rejeski, W., Blair, S. N., Duncan, P. W., Judge, J. O., King, A. C., et al. (2007). Physical activity and public health in older adults: Recommendation from the American College of Sports Medicine and the American Heart Association. *Medicine and Science in Sports and Exercise*, *39*, 1435–1445.

Paskett, E. D., Reeves, K. W., McLaughlin, J. M., Katz, M. L., McAlearney, A. S., Ruffin, M. T., et al. (2008). Recruitment of minority and underserved populations in the United States: The Centers for Population Health & Health Disparities experience. *Contemporary Clinical Trials*, *29*, 847–861.

Robinson, J. M., & Trochim, W. M. K. (2007). An examination of community members', researchers' and health professionals' perceptions of barriers to minority participation in medical research: An application of concept mapping. *Ethnicity and Health*, *12*, 521–539.

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.) New York: Free Press.

Shearer, N., & Fleury, J. (2006). Social support promoting health in older women. *Journal of Women & Aging*, *18*, 3–17.

Smedley, B. D., Stith, A. Y., & Nelson, A. R. (2003). *Unequal treatment: Confronting racial and ethnic disparities in health care*. Washington, DC: National Academies Press.

Stewart, A. L., Verboncoeur, C. J., McLellan, B. Y., Gillis, D. E., Rush, S., Mills, K. M., et al. (2001). Physical activity outcomes of CHAMPS II: A physical activity promotion program for older adults. *Journal of Gerontology: Medical Sciences*, *56A*, M465–M470.

Sullivan-Marx, E. M., Cuesta, C. L., & Ratcliffe, S. J. (2008). Exercise among urban dwelling older adults at risk for health disparities. *Research in Gerontological Nursing*, *1*, 1–10.

Tan, E. J., Lui, L., Eng, C., Jha, A. K., & Covinsky, K. E. (2003). Differences in mortality of black and white patients enrolled in the program of all-inclusive care for the Elderly. *American Geriatrics Society*, *51*, 246–251.

Topp, R., Boardley, D., Morgan, A. L., Fahlman, M., & McNevin, N. (2005). Exercise and functional tasks among adults who are functionally limited. *Western Journal Nursing Research*, *2*, 252–270.

Ware, J. E., & Sherbourne, C. D. (1992). The MOS 36-item short-form health survey: I. Conceptual framework and item selection. *Medical Care*, *30*, 473–483.

Williams, I. C., & Corbie-Smith, G. (2006). Investigator beliefs and reported success in recruiting minority participants. *Contemporary Clinical Trials*, *27*, 580–586.

Wolinsky, F. D., Miller, T. R., Malmstrom, T. K., Miller, J. P., Schootman, M., Andresen, E. M., et al. (2007). Four-year lower extremity disability trajectories among African-American men and women. *Journal of Gerontology: Medical Sciences*, *62*, 525–530.

Yesavage, J. A., Brink, T. L., Rose, T. L., Lum, O., Huang, V., Adey, M. B., et al. (1983). Development and validation of a geriatric depression screening scale: A preliminary report. *Journal of Psychiatric Research*, *17*, 37–49.