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Harvest Health: Translation of the Chronic Disease Self-Management Program for Older African Americans in a Senior Setting

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Abstract

Purpose—We describe the translation of K. R. Lorig and colleagues' Chronic Disease Self-Management Program (CDSMP) for delivery in a senior center and evaluate pre–post benefits for African American participants.

Design and Methods—Modifications to the CDSMP included a name change; an additional introductory session; and course augmentations involving culturally relevant foods, stress reduction techniques, and communicating with racially/ethnically diverse physicians. We recruited participants from senior center members, area churches, and word of mouth. We conducted baseline and 4-month post-interviews.

Results—A total of 569 African American elders attended an introductory session, with 519 (91%) enrolling in the 6-session program. Of the 519, 444 (86%) completed ≥4 sessions and 414 (79%) completed pre–post interviews. We found small but statistically significant improvements for exercise ($p = .001$), use of cognitive management strategies ($p = .001$), energy/fatigue ($p = .001$), self-efficacy ($p = .001$), health distress ($p = .001$), and illness intrusiveness in different life domains (probabilities from .001–.021). We found no changes for health utilization. Outcomes did not differ by gender, number of sessions attended, number and type of chronic conditions, facilitator, leader, or recruitment site.

Implications—The CDSMP can be translated for delivery by trained senior center personnel to African American elders. Participant benefits compare favorably to original trial outcomes. The translated program is replicable and may help to address health disparities.

Keywords

Evidence-based; Translational research; Community participation; Disease management; Program sustainability; Chronic illness

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Chronic health conditions are the major causes of illness, disability, and death among older people, with African Americans bearing a greater burden compared to Whites (Robert Wood Johnson Foundation and the Foundation for Accountability, 2001). African Americans have poorer physical health and greater functional disability (Gitlin, Hauck, Dennis, & Schulz, 2007); are at higher risk for disabling conditions (Ory, Lipman, Barr, Harden, & Stahl, 2000); and have more serious conditions, including stroke, diabetes, cancer, and cardiovascular disease (Committee on Quality of Health Care in America, 2001; Swift, 2002). Additionally, compared to Whites, African Americans have limited access to chronic disease self-management programs (Becker, Gates, & Newsom, 2004) due to multiple social structural barriers including low income, low home ownership, and high unmet housing needs, all contributors to health problems (Kelley-Moore & Ferraro, 2004). Furthermore, African Americans represent an increasing percentage of the aging population and the oldest old, a group at greatest risk for chronic diseases and the highest users of health services.

Philadelphia exceeds national trends, with African Americans representing the largest racial/ethnic minority group (35%) of the aging population. Moreover, Philadelphia’s elderly race composition is expected to shift within the next decade with the current White majority becoming a minority (Glicksman & Norstrand, 2004).

Given associated health care costs and the impact of chronic illness on life quality, developing strategies for helping people manage chronic diseases and addressing health disparities are important public health priorities.

Research has shown that with training and support, persons with chronic disease can learn strategies to effectively self-manage their illness symptoms and that self-management results in important benefits, including decreased service utilization (Chodosh et al., 2005; Goetzel et al., 2007; Ozminkowski et al., 2006; Wagner et al., 2001). Research has shown one patient education approach, the Chronic Disease Self-Management Program (CDSMP), to improve health status and self-efficacy and reduce health care utilization (Lorig, Ritter, et al., 2001; Lorig, Sobel, Ritter, Laurent, & Hobbs, 2001; Lorig et al., 1999).

CDSMP

The CDSMP is a 6-week, 15-hr, peer-led education course based on the premise that people with different chronic conditions present common needs, including dealing with symptoms, complex medication regimens, and lifestyle adjustments. The program empowers patients to assume active roles in maintaining their health. Each session uses didactics and group discussion to teach strategies for managing common symptoms and engaging in healthy behaviors. Session 1 provides an overview of self-management and chronic conditions. Sessions 2 through 5 focus on physical symptoms and emotional challenges such as frustration, fatigue, pain, and isolation. The program introduces easy-to-use symptom management techniques, including stretching, strengthening and aerobic exercises, nutrition, managing medications, and stress reduction practices. Sessions 4 through 6 provide techniques for open communication with family and friends, advance care planning, and partnering with health care providers. Participants establish their own goals and action plans and receive support from leaders and participants to accomplish them throughout.

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Additionally, participants receive the book *Living a Healthy Life With Chronic Conditions* (3rd edition) and a relaxation audiotape available from the Stanford Patient Education Center.

Despite its proven effectiveness as evidenced by randomized trial methodology and adoption internationally (Farrell, Wicks, & Martin, 2004; Griffiths et al., 2005; Lorig, Hurwicz, Sobel, Hobbs, & Ritter, 2005; Lorig, Ritter, & Gonzalez, 2003; Swerissen et al., 2006), with one exception researchers have not systematically evaluated program benefits for older African Americans and delivery within the network of aging services (Goeppinger, Armstrong, Schwart, Ensley, & Brady 2007).

Concerned with health disparities for older African Americans in Philadelphia, we translated the CDSMP, which we renamed Harvest Health (HH), for delivery by a senior center and evaluated whether participants derived similar benefits to those reported in the original Lorig and colleagues (1999) trial with middle-class White patients. We describe our modifications to the CDSMP, participant benefits, lessons learned, and challenges for sustaining the program in senior centers.

Several conceptual frameworks guided this project. First, the translational effort used community-based participatory research (Reason & Bradbury, 2001). A partnership was formed involving a senior center and its members, an academic research center, an Area Agency on Aging, and a medical center to identify target group needs, program modifications, and an implementation and evaluation plan.

The CDSMP is based in self-efficacy theory (Bandura, 1986), which views individuals as self-reflective and capable of reformulating cognitions to control behavior–event contingencies. The CDSMP emphasizes the central role of individuals in managing their illness. It provides the requisite knowledge and skills to enhance self-confidence and enable self-management of health problems to reduce health distress and illness intrusiveness.

Modifications to the CDSMP

Maintaining treatment fidelity is critical to implementing evidence-based programs. However, it is also necessary to adapt programs to optimize adoption by different practice settings and target groups. Identifying modifiable and nonmodifiable treatment components is an important translational step. Four nonmodifiable components of the CDSMP include (a) program delivery by trained, certified facilitators; (b) action plans reflecting participant-identified personal health goals; (c) instruction in symptom management strategies; and (d) peer-led groups that facilitate discussion, problem solving, modeling, and social persuasion.

HH retained these components and implemented nine modifications (see Table 1). Of significance was renaming CDSMP to a nonmedical referent, *Harvest Health*, and creating a program logo (wheat symbol) with historical and biblical roots signifying that one reaps what one sows (e.g., taking care of self results in an abundance of health). Other modifications embedded the program within the cultural framework of the target group and addressed specific challenges such as accessing health care and communicating with racially/ethnically diverse health providers. Program delivery was sensitive to individuals

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with low education. Written materials were reviewed, and leaders provided support for completing written forms (questionnaires, action plans). Program completers received certificates, and group photos were displayed on the center's bulletin boards.

Implementation

The senior center, Center in the Park (CIP), with a membership close to 7,000, recruited participants for HH between 2003 and 2006 from its own membership, area churches, senior housing, and the community at large through word of mouth, media announcements, CIP newsletters, and presentations in community settings. Participants were African American, had a chronic condition(s), and were 60 years or older. Prior to beginning the six-session course, interested individuals were invited to an informational session to be introduced to one another and group leaders, to be oriented to program requirements, and to complete a brief health questionnaire (pretest). The informational session socialized individuals to program expectations, alleviated fears of participation, created a climate of trust for discussing personal health concerns, and provided a mechanism for individuals to complete the baseline questionnaire with facilitator support. Following the completion of six sessions, and 4 months after enrollment, participants were reinterviewed via telephone by a research team member (posttest). We reasoned this gave individuals reasonable time to integrate health lessons into daily routines and independently continue with personal action plans.

In Year 1, all classes were conducted at CIP. During subsequent years, classes were also conducted in a church, in independent-living senior housing for low- and moderate-income individuals, and in a community health clinic. Each 6-week course was capped at 15 participants to ensure adequate numbers and optimize peer interactions in case of dropouts. A few courses enrolled up to 20 participants because of program demand.

A CDSMP certified Master Trainer trained three individuals as facilitators: a retired African American female nurse who was the HH program coordinator, an African American man with programmatic experience with older men who served as outreach coordinator and recruiter, and a retired female African American CIP member.

In all, 38 courses were conducted over 3 years: 8 courses in Year 1 (2 courses running concurrently four times), 20 courses in Year 2 (4 courses running concurrently five times), and 10 courses in Year 3 (2 concurrently, five separate times). The different number of courses offered each year reflected startup needs (hire and training) in Year 1 and available budgets and recruitment goals for the program in subsequent years.

Treatment Fidelity

To ensure that program delivery was as intended and modifications consistently implemented, a representative from the Area Agency on Aging trained in the CDSMP observed 34 randomly selected classes over 3 years by using a brief observational form.

Measures

We evaluated program benefits for multiple domains by using measures with known psychometric properties, although not necessarily with older African Americans, that were

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developed, adapted, or used by Lorig and colleagues (1996, 1999, 2001; see http://patienteducation.stanford.edu/research/) unless noted otherwise.

Physical Activities—We assessed time doing strengthening/stretching exercises (test–retest reliability = .56 for Lorig sample) and five aerobic-type exercises (walking, swimming, bicycling, using exercise equipment, other; test–retest reliability = .72 for Lorig sample) from 0 = none to 4 = more than 3 hr per week. Higher scores indicate greater time expenditure.

Cognitive Symptom Management—We assessed the use of six cognitive strategies (“practice guided imagery,” “try to feel distant from discomfort”) to manage symptoms from 0 = never to 5 = always (α = .77 for our sample). The scale, modified from the Medical Outcomes Study (MOS; Stewart & Ware, 1992), reflects strategies taught in the CDSMP.

We similarly assessed four strategies identified by HH leaders as common to the target group (“talk to self in positive ways,” “listen to music,” “use prayer/meditation,” “take warm baths/massage”). Scores represent participants’ mean response across six items, with higher scores indicating greater cognitive strategy use (α = .72 for our sample).

Communicating With Physician—Participants indicated the use of proactive strategies (preparing question lists, asking questions, discussing personal problems) from 0 = never to 5 = always. Items, developed by Lorig and colleagues, had adequate internal consistency (.73) and test–retest reliability (.89) with her samples. Scores represent participants’ mean response across three items, with higher scores indicating greater communication (α = .79 for our sample).

Health Status—We used the National Health Interview Survey’s single item to measure self-rated health (1 = excellent to 5 = poor; U.S. Census Bureau, 1985).

We rated difficulty performing nine activities (dressing self, getting into/out of bed, lifting cup to mouth, walking outdoors, washing/drying body, bending, turning faucets on/off, getting into/out of car, and getting into/out of bus) from 0 = without difficulty to 4 = unable to do. Lorig and colleagues used eight items, and we added one item (getting into/out of bus). Scores represent participants’ mean response across nine items, with higher scores indicating greater difficulties (α = .84 for our sample).

Using Lorig and colleagues’ adaptation from the MOS, participants rated the extent to which health interfered with social functioning from 0 = not at all to 4 = almost totally. Scores represent participants’ mean response across four items, with higher scores indicating greater impairment (α = .90 for our sample).

We used a five-item index adapted from the MOS to assess energy level (worn out, a lot of energy, tired, enough energy, full of pep) over the past month (0 = none of time to 5 = all of time). Scores represent participants’ mean response across five items, with higher scores indicating greater energy (α = .84 for our sample).

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Health Distress—Using Lorig and colleagues' modification of the MOS health distress scale, participants rated their extent of discouragement with health problems, fear about future health, worries about health, and frustrations over past month (0 = none of time to 5 = all of time). Scores represent participants' mean response across four items, with higher scores indicating greater health distress (α = .91 for our sample).

Health Care Utilization—We examined number of doctor and emergency room visits, hospitalizations, nights in hospital, and admissions to a minimal care facility.

Self-Efficacy—We used a six-item index developed by Lorig and colleagues to assess confidence managing chronic disease symptoms rated from 1 = not at all confident to 10 = totally confident (α = .92 for our sample).

Illness Intrusiveness—We evaluated illness intrusion on physical health (two items; α = .60); work and finances (two items; α = .61); marital, sexual, and family relations (three items; α = .80); recreation and social relations (three items; α = .78); and other aspects (three items; α = .83) along a 10-point scale (0 = not very much to 10 = very much). Scores represent participants' mean response across items within each domain, with higher scores indicating greater intrusiveness.

Data Analysis

We compared program completers (4–6 sessions) to noncompleters on baseline characteristics by using chi-square and Wilcoxon rank sum tests. We also compared individuals with 4-month post-evaluations to those without by using similar nonparametric procedures. To examine outcomes, we conducted paired Wilcoxon tests on data for individuals with pre–post evaluations (N = 414), which included 41 individuals attending less than 4 sessions. We ran the same paired tests excluding the 41 but did not find any differences and thus report outcomes for 414 participants.

We used mixed model cluster analysis to evaluate whether group assignment (interaction of leader, facilitator, and site) affected selected outcomes. We found no meaningful or statistically significant interaction effects.

We computed pre–post difference scores for each outcome to enable between-group comparisons by gender, number of sessions attended, and number of health conditions (1 = <2 conditions, 2 = 2 conditions, 3 = 3 conditions, 4 = ≥4 conditions) using nonparametric Mann–Whitney tests.

We performed analyses using SPSS, Version 15.0.

Participation Rates

Of the 569 individuals who were recruited for HH and who attended the initial introductory session, 519 (91%) enrolled and 50 (9%) were unwilling to participate. Of the 519 enrollees, 444 (86%) completed the course (attending 4 or more of 6 sessions). The 75 (14%) with <4 classes reported illness (n = 19), time conflicts (n = 7) or other reasons (n = 49) for not completing the course. We did not observe large or statistically significant differences

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between completers (4+ sessions) and noncompleters on background characteristics or study outcome measures.

Of the 519 enrollees, 414 (80%) completed pre–post evaluations and 105 did not. Of the 414, 380 completed 4 to 6 sessions, and 34 completed <4 sessions but agreed to the post-evaluation. Of the 105 without post-evaluation data, 64 completed the course and 41 did not.

We compared individuals with 4-month evaluations ($n = 414$) to those without ($n = 105$) and found that CIP members were more likely to complete post-evaluations ($p = .038$). Also, those without post-evaluations had more symptoms, including pain, feeling tired, fatigue ($M = 2.5$, $SD = 1.2$ vs $M = 2.3$, $SD = 1.1$; $p = .034$), greater health distress ($M = 1.6$, $SD = 1.3$ vs $M = 1.2$, $SD = 1.1$; $p = .007$), and health care utilization ($M = 0.9$, $SD = 6.5$ vs $M = 0.0$, $SD = 0.0$; $p = .045$).

Participant Characteristics

The 519 enrollees were on average 73 years old, female, unmarried, with a high school education (see Table 2). Participants reported an average of three health conditions, with 59.4% indicating ≥3 chronic conditions. Common conditions included high blood pressure (74%), arthritis (66%), and diabetes (34%). Participant characteristics were similar to those of CIP members at large.

Of the 414 with post-evaluations, 8% completed 1 to 3 sessions, 14.5% completed 4 sessions, 29% completed 5 sessions, and 49% completed 6 sessions.

As expected, a nonparametric comparison of recruitment site by demographic characteristics revealed statistically significant differences for CIP membership ($\chi^2 = 74.7$, $p = .000$), with 80.5% ($n = 385$ out of 478) of participants at CIP reporting membership compared to the other three recruitment sites ($\chi^2 = 65.5$, $p = .001$), in which 24.4% ($n = 10$ out of 41) of the participants were CIP members. There were no other statistically significant differences by site.

Program Outcomes

Observations of 34 randomly selected sessions revealed that facilitators delivered sessions as intended 100% of the time, including presenting material intended for the particular session, involving participants in group discussion, and reviewing action plans.

At 4 months, participants reported small but statistically significant improvements in time spent in physical activities (47.8% reporting improvement for strengthening exercises and 60.0% for other exercises). Also, we found improvements in the use of cognitive symptom management (50.6% improving), social role function (41.2% improving), energy/fatigue levels (50.0% improving), health distress (59.1% reporting less distress), self-efficacy (60.3% improving), and all areas of illness intrusiveness (36.7%–61.0% improving). Participants reported a slight reduction in the use of relaxation strategies (34.3% indicating less use). We found no statistically significant improvements for communicating with physician, self-rated health, disability status, or health utilization indicators (see Table 3).

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There were no large or statistically significant differences in change scores from pre- to post-evaluations between men (*n* = 52) and women (*n* = 362) on outcome measures except for time spent in strengthening/stretching exercise (*p* = .022), with women reporting slightly better levels (*M* = 0.7, *SD* = 1.5) than men (*M* = 0.0, *SD* = 1.9).

There were also no large or statistically significant pre–post differences based on number of sessions attended or type or number of chronic conditions. Also, we did not find leader–facilitator–site interaction effects. That is, regardless of site or leader, and number or type of chronic condition, participants reported similar benefits. Finally, 396 (96%) individuals indicated that they continued to use their action plan strategies at 4 months.

Discussion

HH demonstrates the utility of the CDSMP with an underserved population, necessary modifications, and feasibility of having trained, certified senior center staff delivering the program. The high rate of initial interest (*n* = 569), enrollment (*n* = 519), and retention (*n* = 444) within a brief period (24 months) reflects its salience for this group and the ability of a senior center to rapidly enroll the community it serves.

HH had small but statistically significant benefits for participants in four clinically relevant areas (Schulz et al., 2002): quality of life, through improved self-efficacy and decreased health distress; reduced symptomatology, represented by declines in illness intrusion; social significance, such as maintenance of health utilization patterns over 4 months; and social validity or acceptability and perceived benefit, demonstrated by attendance and retention rates. Personal testimonials such as the following attest to the profound effect of the program on health and overall well-being:

> My blood sugars and my blood pressure are now normal. I am now eating more fruits, vegetables and walking for exercise. I feel so much better. I am no longer tired, depressed and sluggish. The positive health habits are now a part of my life and I cannot imagine going back to my old habits.

and

> I've been confined to this motorized wheelchair for two years. My action plan is to walk in the corridor at Center in the Park. Thanks to the motivation and support from my peers and the instructors after 4 weeks, I'm walking in the corridor, which is 140 steps.

Pre–post changes of HH compared favorably to those in the Lorig and colleagues (1999) trials. Although we did not find health utilization changes, 4-month patterns were similar to baseline. We did not find leader, facilitator, or site effects, or large or statistically significant differences by gender, level of exposure to course content, or chronicity, suggesting that HH provided similar benefits to all participants with a range of chronic health conditions and symptoms. Noncompleters had poorer health than completers, suggesting that the program should be available to individuals when initially diagnosed with a chronic disease and that a different intervention may be necessary for a more distressed group.

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Important questions regarding clinical relevance remain, including how long benefits are sustained, whether improvements reflect objective health changes, and what the long-term impact is on health utilization. Also, word of mouth was an important recruitment source, making it unclear whether individuals were predisposed to view the program positively. Nevertheless, previous research has shown that lifestyle changes such as those reported here, if sustained, can positively impact health and reduce utilization (Clark et al., 2000; Wagner et al., 2001). Future research is warranted to further evaluate health-related outcomes, whether booster sessions are needed for continued self-management, and whether the program reduces health disparities.

Challenges and Lessons Learned

Three factors are critical to successfully replicating HH in other community-based settings. The first involves staffing. It is important to involve facilitators who are knowledgeable about the target population, can build trust, and demonstrate an authentic commitment to helping people improve their health. This is pivotal to program success, as participant testimonies demonstrate: “I want to thank [the instructors] for their positive attitude and helpfulness. They gave us lots of useful information for now and into the future. This is a wonderful program and I hope it will continue.” Another participant said:

> Having an action plan and receiving support from my instructors helped me overcome my fears and anxiety. I am no longer afraid to be alone. I am exercising, eating healthy, and I’ve lost about 8 pounds. I’m now doing volunteer work at CIP and also at my church. My doctor is very pleased with my progress.

A related point is that staff must value the importance of evidence-based programs and implementing them as intended. Observation and rating of staff to ensure program fidelity must be embedded in programmatic considerations; if not, drift can occur.

A second consideration is marketing. Designing and disseminating culturally appropriate and relevant marketing materials is essential for successful recruitment and enrollment. When collecting evaluation data, it is critical to explain to staff and participants why specific questions are asked and how responses will be used for program improvements.

A third consideration is an agency’s capacity to deliver HH, including bearing unfunded associated costs (e.g., providing limited space, administrative support, supplies, utilities, travel costs for training and licensing fees) and using resources for a free program instead of offering other potentially paid-for programming.

The most critical challenge facing CIP and senior centers who adopt HH is sustaining the program. Noteworthy is that high expectations for program continuation among CIP members and former HH participants have required CIP to reallocate committed resources to exploring ways to offer the program.

CIP has identified steps an agency can take to enhance opportunities for sustainability. One is to establish the acceptability of providing evidence-based programming in an agency by educating the organization’s board, administrators, and staff and incorporating such programs into the strategic planning process for health promotion offerings. Another

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approach is to identify ways to translate the benefits of HH participation to ongoing paid center activities. For example, HH participants are encouraged to join the senior center and participate in fee-paid offerings such as fitness programs, health promotion activities, and life-long learning classes that support chronic disease self-management.

Another challenge is implementing a practical evaluation approach. In this project, resources were available for research partners to collect and analyze data. At a minimum, evaluation of HH by senior centers should include attendance, documentation of individual action plans, program satisfaction, self-rated health, and efficacy to provide indicators of acceptability, adherence to goal attainment, and programmatic gains.

In conclusion, HH represents a successful translation of the CDSMP for an African American community and for delivery by senior center staff. Important lessons and challenges for replication at the community level were gleaned. HH embraces the essential elements for managing chronic illness, including utilizing community resources and partnerships to develop and support programming and encouraging and providing skills to persons to participate in self-management. The most critical challenge is developing a funding mechanism for sustaining this program within the network of aging services.

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Table 1

Modifications to the Chronic Disease Self-Management Program

Modification	Purpose
1. Name change to Harvest Health	Name and logo refers to abundance in health and spirituality. Does not impose medical terminology, which may be perceived as threatening.
2. Orientation session 1 week prior to start of sessions	Provided participants with the opportunity to meet facilitators and learn about course requirements prior to committing to the program.
3. Use of culturally grounded language for key words	"Sugar" was used along with "diabetes." Additional approaches to symptom management common among African Americans were introduced, including listening to music, using prayer and meditation, taking a warm bath or massage, and spending time with family/friends.
4. Change in reference to Black church in instructor's manual and replacement with reference to "spirituality"a	Many African Americans participants did not belong to a traditional Black church as referred to in the manual, so use of the term *spirituality* encompassed the experiences and orientation of all participants.
5. Use of culturally appropriate music during aerobic phase of session	Culturally grounded the information provided.
6. Serving of healthy snacks and emphasis on avoiding sweets and salt[a]	Provision of fresh fruit, whole wheat or grain bagels, fruit juices without added sugar, and raw sugar for tea/coffee modeled concrete examples and promoted socialization.
7. Introduction of moment of silence at beginning of each session	Rather than prayer, which some found offensive, a moment of silence recognized spiritual practices and their importance to participants.
8. Additional unit on communicating with health care provider of a different racea	Added at the request of participants, the session emphasized communication skills specific to interacting with individuals of a different race.
9. Certificate of completion of program	Certificate was provided at the sixth session, and a group photo was taken and displayed on Center in the Park's bulletin boards.

[a] *Note*: Adaptation developed by Jean Goeppinger, RN, University of North Carolina.

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Table 2

Background Characteristics of Participants (*N* = 519)

Characteristic	*M* (*SD*)	Range	%
Age	73.1 (7.9)	56.3–94.1	
Gender			
Male			14.0
Female			86.0
Marital status			
Married			30.7
Unmarried			69.3
Education			
< High school			14.1
High school			41.3
> High school			44.6
Employment status			
Employed			3.4
Unemployed			96.6
Volunteer status			
Volunteer			45.1
Nonvolunteer			54.9
Center in the Park membership			
Member			75.9
Nonmember			24.1
Health/wellness activities			
Participant			35.6
Nonparticipant			64.4
Health conditions			
Diabetes			33.5
High blood pressure			74.9
Asthma			12.6
Chronic obstructive pulmonary disease			3.6
Heart disease			23.6
Arthritis			66.2
Cancer			9.8
Physical ability difficulty	1.8 (2.7)	0.0–18.0	

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Table 3

Participant Health-Related Behavior (*N* = 414)

	M **(*SD*)**					
Outcome	**Pretest**	**Posttest**	**Range of Change**	***M*** **(*SD*) Change**	***Z*** [a]	***p***
Physical activities						
Minutes per week of strengthening/ stretching exercise[b]	1.4 (1.3)	2.0 (1.4)	−4.0, 4.0	0.6 (1.6)	−7.56	.001
Other exercise activities (walking, swimming, etc.)[b]	3.2 (3.2)	4.5 (2.9)	−16.0, 10.0	1.3 (3.3)	−8.20	.001
Cognitive symptom management						
Cognitive strategies[c]	1.3 (0.9)	1.5 (0.9)	−4.0, 3.5	0.2 (1.0)	−3.84	.001
Relaxation strategies[c]	3.0 (1.1)	2.7 (1.1)	−4.0, 3.0	−0.3 (1.1)	−5.04	.001
Communication with physician[c]	3.0 (1.2)	3.1 (1.2)	−4.3, 3.7	0.1 (1.3)	−1.88	.060
Health status						
Self-rated health	2.8 (0.8)	2.9 (0.8)	−4.0, 2.0	0.1 (0.7)	−1.62	.106
Disability[d]	0.2 (0.3)	0.2 (0.3)	−0.9, 1.1	0.0 (0.2)	−0.07	.947
Social role function[c]	1.0 (1.0)	0.9 (1.0)	−2.5, 2.5	−0.1 (0.8)	−3.12	.002
Energy/fatigue	2.3 (1.0)	2.2 (1.0)	−2.2, 2.4	−0.1 (0.8)	−3.46	.001
Health distress[c]	1.2 (1.1)	0.8 (0.9)	−4.3, 2.3	−0.5 (0.9)	−9.28	.001
Health care utilization[c]	0.2 (1.0)	0.3 (1.6)	−4.4, 6.8	0.1 (1.0)	−0.81	.418
Doctor visits[b]	3.2 (2.9)	3.3 (3.0)	−16.0, 21.0	0.2 (3.2)	−1.17	.241
Emergency room visits[c]	0.2 (0.4)	0.2 (0.8)	−2.0, 3.0	0.0 (0.6)	−0.11	.916
Number of times hospitalized[c]	0.1 (0.2)	0.1 (0.3)	−2.0, 2.0	0.0 (0.4)	−1.42	.154
Number of nights in hospital[c]	0.2 (0.8)	0.3 (1.3)	−6.0, 7.0	0.0 (1.1)	−1.15	.252
Minimal care facility admission[c]	0.0 (0.0)	0.1 (1.0)	0.0, 13.0	0.1 (0.9)	−1.60	.109
Self-efficacy[c]	7.2 (2.1)	7.8 (1.9)	−8.0, 8.5	0.6 (2.0)	−6.05	.001
Illness intrusiveness						
Physical well-being and diet	3.7 (2.6)	2.8 (2.6)	−8.5, 7.0	−0.9 (2.4)	−6.94	.001
Work and finances	3.6 (2.8)	2.9 (2.8)	−9.5, 6.5	−0.7 (2.4)	−5.76	.001
Marital, sexual, and family relations[b]	2.0 (2.5)	1.5 (2.3)	−8.5, 8.5	−0.5 (2.2)	−4.02	.001
Recreation and social relations[c]	2.5 (2.4)	2.3 (2.3)	−8.0, 5.7	−0.2 (1.9)	−2.30	.021
Other aspects of life[c]	1.9 (2.4)	1.6 (2.3)	−10.0, 6.7	−0.2 (2.0)	−2.42	.015

[a] *Notes*: Wilcoxon signed rank *t*.

[b] *N* = 412.

[c] *N* = 413.

[d] *N* = 354.