

Activating Seniors to Improve Chronic Disease Care: Results from a Pilot Intervention Study

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OBJECTIVES: To evaluate the effect of an activation intervention delivered in community senior centers to improve health outcomes for chronic diseases that disproportionately affect older adults.

DESIGN: Two-group quasi-experimental study.

SETTING: Two Los Angeles community senior centers.

PARTICIPANTS: One hundred sixteen senior participants.

INTERVENTION: Participants were invited to attend group screenings of video programs intended to inform about and motivate self-management of chronic conditions common in seniors. Moderated discussions reinforcing active patient participation in chronic disease management followed screenings. Screenings were scheduled over the course of 12 weeks.

MEASUREMENTS: One center was assigned by coin toss to an encouragement condition in which participants received a \$50 gift card if they attended at least three group screenings. Participants in the nonencouraged center received no incentive for attendance. Validated study measures for patient activation, physical activity, and health-related quality of life were completed at baseline and 12 weeks and 6 months after enrollment.

RESULTS: Participants attending the encouraged senior center were more likely to attend three or more group screenings (77.8% vs 47.2%, $P = .001$). At 6-month follow-up, participants from either center who attended three or more group screenings ($n = 74$, 64%) reported significantly greater activation ($P < .001$), more minutes walking ($P < .001$) and engaging in vigorous physical activity ($P = .006$), and better health-related quality of life (Medical Outcomes Study 12-item Short-Form Survey (SF-12) mental component summary, $P < .001$; SF-12 physical component summary, $P = .002$).

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CONCLUSION: Delivering this pilot intervention in community senior centers is a potentially promising approach to activating seniors that warrants further investigation for improving chronic disease outcomes. *J Am Geriatr Soc* 58:1496–1503, 2010.

Key words: chronic diseases; patient activation; self-management

Chronic diseases, including coronary artery disease, congestive heart failure, diabetes mellitus, and chronic low back pain disproportionately affect older adults.¹ Cardiovascular disease is the leading cause of death in the United States, accounting for 29% of all deaths in 2001.² Diabetes mellitus is the sixth leading cause of death and when managed suboptimally causes complications that significantly impair quality of life, in addition to contributing to vascular disease.² Chronic low back pain affects as many as 50% of community-dwelling adults, causing substantial impairments in functioning and health-related quality of life.³ Of adults aged 65 and older, as many as 85% suffer from one or more chronic diseases.¹ A recent estimate suggests that individuals with one or more chronic conditions account for almost 50% of total healthcare expenditures.⁴

Patient activation—defined as being able to self-manage symptoms and problems, engaging in activities that maintain functioning and reduce health declines, and being involved in clinical decision-making—can significantly improve health outcomes in chronic disease management.^{5–8} Nevertheless, the question of how best to activate patients remains unanswered.^{6,9} The Chronic Care Model has been proposed as a template for enabling primary care to respond effectively to the challenges of managing patients with chronic conditions,¹⁰ but it has been argued that the lack of effective strategies to activate patients has limited the full implementation of this model.⁹ Evidence that patient activation is mutable and can be increased in older

adults with chronic conditions strengthens the urgency of answering the question of how to activate patients.⁷

The vast majority of patients' self-management activities for chronic conditions happen outside of healthcare settings, in the community, for example, reducing dietary fat, increasing physical activity, or self-monitoring blood glucose and pressure. For this reason, it was desired to conduct an initial test of a novel but relatively simple intervention for seniors with chronic conditions to determine whether it could increase their level of activation. Participants were recruited from two multipurpose community senior centers. A recent estimate suggests that 14,000 centers throughout the United States serve more than 10 million seniors annually.¹¹

METHODS

Setting

A large number of older adults regularly use community senior centers to access services and seek social support.¹² These centers provide access to health and wellness services and often include small fitness centers. They also organize social activities for seniors, such as group card games, dances, and field trips to other locations. Many centers also provide access to hot meals, which for some seniors are federally subsidized. Findings from several studies suggest that senior centers can serve as an effective venue for providing health education and changing the health behavior of older adults.¹³⁻¹⁵ The present study took place in two community senior centers in greater Los Angeles. One senior center was located in a low-income predominately African-American neighborhood and serves approximately 8,000 seniors according to the center director (Center 1). The other center was located in a middle-income ethnically mixed neighborhood and serves approximately 5,000 seniors (Center 2). The senior centers were selected because they previously participated in and were receptive to health-promotion research conducted by University of California at Los Angeles (UCLA) investigators. These two previous intervention studies took place from 2003 to 2006 and in 2007, respectively.

Intervention

Each of the two senior centers was provided a set of five video programs (each 20 to 45 minutes long) developed by the Foundation for Informed Medical Decision Making. Four of the five video programs were about chronic diseases common in older adults: coronary artery disease, congestive heart failure, type II diabetes mellitus, and chronic low back pain. The fifth program was focused on the role of advance directives for articulating healthcare preferences in the case of incapacitation or at the end of life. Each of the chronic disease programs emphasized the importance of engaging in self-care behaviors known to improve management of the respective disease, such as reducing dietary fat and increasing physical activity for coronary artery disease; managing sodium intake and monitoring body weight for congestive heart failure; monitoring glycosylated hemoglobin, blood pressure and cholesterol for diabetes mellitus; and engaging in physical activity to manage low back pain. The programs combined education with a motivational tone, using inter-

views with real patients to illustrate different individuals' ways of increasing self-management of chronic conditions. During the 12-week intervention period, in both community senior centers, each program was shown in group screenings on multiple occasions on different days and at different times to maximize the opportunities for seniors to attend. A single trained facilitator (DR) who moderated discussion with the participants after viewing the video program led the group screenings in both centers. The facilitator, who was a member of the research team, had a bachelor's degree and received training from the investigators in the basic principles of motivational interviewing.¹⁶ During the discussions, the facilitator continued to reinforce the importance of active self-management to improve chronic disease outcomes. Attendance at group screenings was captured with sign-in sheets in both senior centers.

Design

The primary hypothesis was that repeated exposure to the message that active self-management would improve chronic disease outcomes would lead to greater patient activation, regardless of the specific chronic disease context. Different potential research designs were considered to increase exposure to the intervention materials and test this hypothesis. Assigning one community senior center to the intervention and the other to a no-intervention control condition was excluded because receiving no intervention would probably lead to differential completion rates of study measures. Similarly, randomization at the individual level was excluded, because this would entail a high risk of contamination within each senior center. Instead, it was decided to assign one center by coin toss to an encouragement condition, in which participants would receive a \$50 gift card if they attended three or more different intervention group screenings. Study procedures were identical in the nonencouraged center, except that participants did not receive the \$50 incentive for attending three or more group screenings. Participants in both centers were encouraged to attend group screenings. The UCLA institutional review board reviewed and approved the study protocol (ClinicalTrials.gov identifier: NCT00651495).

Participant Recruitment

Seniors attending both centers were invited to information sessions that provided simple refreshments and described the intervention program. The information sessions were conducted on multiple occasions in equal numbers in both centers. The sessions described the availability of the video programs focused on living with chronic conditions and informed seniors that they could view these programs on their own (with equipment provided to the senior centers for this purpose) or participate in group screenings. Seniors in both centers were encouraged to attend group screenings to take advantage of the opportunity to discuss the program content with peers and the trained facilitator. Watching the programs individually or participating in the group screening did not require participation in the study testing the hypothesis. At the end of the information session, seniors were told that volunteers were sought to help evaluate the intervention program. Volunteers had to meet the following four criteria: aged 55 and older, able to ambulate on

their own, able to complete questionnaires without assistance, and able to read and write English. Individuals attending the community senior center assigned to the encouragement condition who agreed to participate in the evaluation were told that they could earn a \$50 gift card for attending three or more group screenings. (The incentive was not available to individuals who did not participate in the evaluation of the intervention.) Individuals who were willing to participate in the evaluation of the intervention reviewed and completed an informed consent document and completed the baseline questionnaire. The 12-week intervention period began after enrollment into the study was completed. The target sample size was 60 seniors per center ($N = 120$).

Measures

Participants completed study measures at baseline, after the 12-week intervention period, and 6 months after enrolling in the study. All participants received a \$10 gift card for each completed survey, for a total of \$30 for completing all three surveys. These payments were in addition to the \$50 participants attending the center assigned to the encouragement condition could earn for attending three group screenings. Completion rates of 98.3% were achieved for both follow-up surveys. Follow-up completion was similar in each of the centers. With the exception of group screening attendance, which was recorded with sign-in sheets at each screening, all study measures were based on self-report. Participants answered demographic and health history questions, including history of chronic diseases and number of prescribed medications, at baseline. At each assessment point, participants completed the previously validated Patient Activation Measure (PAM),^{5,17} a brief previously validated measure of physical activity¹⁸ and the Medical Outcomes Study 12-item Short-Form Survey (SF-12) measure of health-related quality of life.¹⁹ The PAM is a 13-item measure that assesses patients' self-rated ability to take preventive actions, manage symptoms of medical problems, find and use appropriate medical care, and work with healthcare providers to make decisions about care.¹⁷ The PAM produces a single score that has been shown to be reliable and valid. Higher scores indicate greater activation and correlate with better chronic disease self-management and greater engagement in preventive behaviors.^{6,9} The physical activity measure used in this study consisted of nine items and has been shown to have sensitivity and validity comparable with those of the widely used 7-day Physical Activity Recall.¹⁸ The measure enables estimation of the number of minutes an individual engaged in walking and moderate and vigorous physical activity in the past week. The SF-12 is a shortened version of the widely used SF-36 measure of health-related quality of life.¹⁹ It was decided to use the SF-12 to reduce respondent burden and because the measure has been shown to have good validity despite using fewer items than the SF-36.¹⁹ In addition to these measures, participants also answered questions assessing subjective perceptions of change in the following domains at 12 weeks and 6 months: willingness to ask questions of a physician, confidence in one's ability to ask questions of a physician, general health, who is responsible for managing one's health, and what one does to

manage one's health.²⁰ Each of these questions had 7-point Likert-type response options with a mid-point of no change and anchors indicating positive or negative change. The questions were internally consistent with a Cronbach alpha of 0.92. At follow-up, participants also answered several open-ended questions that asked about any changes they had made in how they treat their condition as a result of participating in the intervention program.

Statistical Analysis

Continuous measures were analyzed using analysis of variance (ANOVA) models. Baseline scores were included in the models as a covariate, as were the number of chronic diseases reported. The effect of two independent variables was tested. First whether outcomes differed according to senior center attended was tested. Second, because the primary interest was in the effect of repeated participation in group screenings on the outcome measures, participants were dichotomized based on whether they attended three or more or two or fewer chronic disease program group screenings. Interaction effects of these two variables were also tested for to determine whether there were differential effects of repeated exposure to the programs depending on which senior center participants were recruited from. Estimated marginal means are reported for each ANOVA model, which adjusts the means taking into account the covariates included in the model. Categorical measures were analyzed using the Pearson chi-square test. Data were analyzed using SPSS 17.0 (SPSS, Inc., Chicago, IL).

RESULTS

One hundred sixteen participants were enrolled in the study between April 2, 2008, and May 15, 2008. Before evaluating the main study hypotheses, the baseline characteristics of participants were compared according to community senior center and whether they attended three or more group screening sessions (Table 1). Participants recruited from the community senior center assigned to the encouragement condition (Center 1) were somewhat younger, were more likely to be African American, had fewer years of education, and reported lower household incomes. These differences in demographic characteristics reflect the neighborhood characteristics of the respective geographical locations of the community senior centers. They also reported significantly more minutes walking per week and higher SF-12 mental health component scores.

The financial incentive was successful in increasing participation in three or more group screenings. In Center 1, 77.8% of participants attended three or more group screenings, compared with 47.2% of participants in Center 2 ($P = .001$). Correspondingly, as also shown in Table 1, there were some differences in baseline characteristics between those who attended three or more group screenings and those who attended fewer. Participants who attended three or more screenings were somewhat younger, more likely to be female, and marginally more likely to be African American and have lower household incomes. Although the differences were nonsignificant, participants who attended three or more group screenings reported somewhat more physical activity at baseline, despite number of self-reported chronic conditions, prescription medications, and baseline

Table 1. Baseline Participant Characteristics

| Characteristic | Center 1* (n = 63) | Center 2 (n = 53) | P- Value | ≤2 Screenings (n = 42) | ≥3 Screenings (n = 74) | P- Value |
|--|-----------------------|----------------------|-------------|---------------------------|---------------------------|-------------|
| Age, mean ± SD | 70.6 ± 7.7 | 73.6 ± 8.3 | .046 | 73.9 ± 9.3 | 70.9 ± 7.2 | .049 |
| Female, % | 83.9 | 71.7 | .11 | 61.9 | 87.7 | .001 |
| Widowed, % | 44.1 | 32.0 | .16 | 36.6 | 39.7 | .16 |
| Ethnicity, % | | | | | | |
| African American | 93.7 | 19.6 | <.001 | 43.9 | 69.9 | |
| Caucasian | 0.0 | 58.8 | | 41.5 | 17.8 | .05 |
| Latino | 4.8 | 7.8 | | 7.3 | 5.5 | |
| > High school education, % | 50.0 | 92.5 | <.001 | 78.0 | 64.9 | .27 |
| Income <\$35,000, % | 63.6 | 46.0 | .004 | 48.7 | 59.1 | .05 |
| Number of chronic conditions, mean ± SD | 2.0 ± 1.0 | 1.8 ± 1.1 | .22 | 1.9 ± 1.0 | 2.0 ± 1.1 | .80 |
| Number of prescription medications, mean ± SD | 4.0 ± 3.2 | 3.3 ± 2.6 | .27 | 3.7 ± 2.3 | 3.7 ± 3.3 | .94 |
| Baseline Patient Activation Measure score, mean ± SD | 62.5 ± 14. | 66.2 ± 16.0 | .19 | 63.6 ± 13.6 | 64.4 ± 16.1 | .78 |
| Baseline walking, min/wk, mean ± SD | 152.2 ± 137.5 | 102.2 ± 100.5 | .04 | 101.7 ± 94.8 | 143.9 ± 135.2 | .10 |
| Baseline moderate activity, min/wk, mean ± SD | 81.8 ± 87.4 | 72.2 ± 90.0 | .58 | 72.2 ± 76.5 | 80.4 ± 94.9 | .64 |
| Baseline vigorous activity, min/wk, mean ± SD | 82.6 ± 90.4 | 57.2 ± 80.7 | .14 | 52.2 ± 57.3 | 80.3 ± 94.9 | .12 |
| Baseline Medical Outcomes Study 12-item Short-From Survey score, mean ± SD | | | | | | |
| Physical component summary | 45.2 ± 6.6 | 47.7 ± 7.1 | .06 | 46.5 ± 7.1 | 46.4 ± 6.9 | .97 |
| Mental component summary | 55.8 ± 5.0 | 52.6 ± 6.6 | .005 | 54.0 ± 6.2 | 54.4 ± 5.9 | .72 |

* Randomized to the encouragement condition.
SD = standard deviation.

PAM scores were virtually identical in participants who attended three or more group screenings and those who did not. Although both community senior centers were provided with a television and DVD player, to enable seniors to watch the programs on their own, no seniors in either community center watched the programs outside of the scheduled group screenings.

Primary Outcome Measures

Controlling for baseline scores and number of chronic diseases, differences in PAM scores at 12 weeks between participants from the two centers were nonsignificant ($P = .32$), although participants who attended three or more chronic disease group screenings in either center reported significantly higher PAM scores at 12 weeks (mean (standard error) 66.2 (1.3) vs 61.6 (1.7); $P = .04$). The interaction

between center and number of screenings attended was nonsignificant. At 6-month follow-up, there were significant differences in PAM scores between the two centers ($P = .006$) and between those who attended three or more group screenings and those who attended two or fewer or no group screenings (76.8 (1.4) vs 61.4 (1.9); $P < .001$). The interaction between center and number of screenings attended was also significant ($P = .04$), with greater differences according to group screening attendance in Center 1 than in Center 2. Table 2 shows the proportion of participants who increased their activation and the corresponding average increase at 6-month follow-up according to baseline activation level and number of screenings attended. A significantly greater proportion of participants who attended three or more screenings increased their activation level ($P < .001$).

Table 2. Proportion of Participants with Increases in Activation at 6-Month Follow-Up According to Number of Screenings Attended and Baseline Activation Level

| Baseline Activation Level* | Participants Attending ≤2 Screenings (n = 42) | | | Participants Attending ≥3 Screenings (n = 72) | | |
|----------------------------|---|-------------------------|-----------------------------------|---|-------------------------|-----------------------------------|
| | n | Increased Activation, % | Increase in Activation, Mean ± SD | n | Increased Activation, % | Increase in Activation, Mean ± SD |
| 1 | 3 | 100 | 15.4 ± 6.9 | 7 | 100 | 32.2 ± 6.8 |
| 2 | 8 | 75 | 12.4 ± 16.0 | 17 | 100 | 27.4 ± 7.3 |
| 3 | 18 | 56 | 1.1 ± 17.1 | 21 | 100 | 17.5 ± 6.5 |
| 4 | 13 | 15 | -13.8 ± 15.4 | 27 | 33 | -6.7 ± 14.1 |

* Patient activation scores range from 0 to 100 and are divided into four levels. Level 1 (score ≤47.0) is associated with not believing that one has a role to play in self-management of chronic conditions. Level 2 (score 47.1–55.1) is associated with a lack of knowledge and confidence to take action in self-management of chronic conditions. Level 3 (score 55.2–67.0) is associated with beginning to take action in self-management. Level 4 (scores ≥67.1) is associated with maintaining behavior change, although individuals may still experience difficulties overcoming obstacles.⁹
SD = standard deviation.

Controlling for baseline physical activity and number of chronic diseases, participants who attended three or more chronic disease group screenings reported significantly more minutes per week walking at 12 weeks (150.7 (12.7) vs 78.8 (17.4); $P = .001$) and 6-month follow-up (102.3 (6.2) vs 55.3 (8.5); $P < .001$) than those who attended fewer or no group screenings. Differences according to center attended were nonsignificant, and there was no interaction effect. Differences in minutes of vigorous physical activity per week were nonsignificant at 12 weeks according to center ($P = .98$) and screenings attended ($P = .17$), but at 6 months, there were significant differences in vigorous physical activity according to center ($P = .01$) and number of screenings attended (54.3 (6.3) vs 23.8 (8.8); $P = .006$). The interaction was nonsignificant. Differences in moderate physical activity were nonsignificant at both time points according to center and number of screenings attended. The data indicated that participants did not substitute one type of physical activity for another (results not shown).

There were no differences in SF-12 scores at 12 weeks, but at 6-month follow-up, participants who attended three or more group screenings reported significantly higher physical ($P = .002$) and mental health component scores ($P < .001$). Differences according to center attended were nonsignificant, and there was no interaction effect, for physical and mental component scores. Figure 1 shows differences in SF-12 physical component and mental health component scores between those who attended three or more group screenings and those who did not.

Subjective Perceptions of Change

Table 3 shows participants' subjective perceptions of change at 6-month follow-up according to number of group screenings attended. Participants who attended three or more group screenings indicated significantly greater change in their willingness ($P < .001$) and confidence to ask questions of their physician ($P < .001$). They also reported greater change in their sense of personal responsibility for their health ($P < .001$) and making more changes in activities to manage their health ($P < .001$). Finally, they perceived significantly greater change in their subjective health rating ($P < .001$). The differences were less pronounced in

participants from the two centers but were also significant, with the exception of willingness to ask questions of a physician (results not shown).

Completion of Advance Directive

The 6-month follow-up survey queried whether participants had completed an advance directive or intended to complete one since beginning participation in the study. Participants who attended the group screening focused on advance directives (58.6% of participants in both centers) were significantly more likely to report having recently completed an advance directive (13.4% vs 2.1% of those who did not attend; $P = .04$) or having an intention to complete one (41.0% vs 17.4% of those who did not attend; $P = .009$). Overall, participants who attended the group screening focused on advance directives were four times as likely as participants who did not attend the screening to have completed or intend to complete an advance directive (odds ratio = 4.03, 95% confidence interval = 1.62–10.05, $P = .003$).

Corroborating Qualitative Data

At 6-month follow-up, participants answered several open-ended questions querying whether they had spoken to their physician about something they learned from the intervention video programs, whether they had decided with their physician to change their treatment regimen, or whether they had changed how they treated their chronic condition. Table 4 shows a sample of open-ended survey responses and the participants' corresponding changes in activation from baseline to 6-month follow-up. These responses corroborate the quantitative findings by illustrating specific ways in which participants became activated as a result of participating in the intervention. Participants described asking about specific interventions they learned about (e.g., statin drugs to lower cholesterol), making decisions with their physicians to alter their treatment regimens, and engaging in more self-care behaviors.

DISCUSSION

Despite the potential of patient activation to improve chronic disease outcomes, widespread implementation of patient activation interventions has not occurred.^{6,9} The present study provides important pilot data in support of further investigation of interventions in community settings to activate seniors with a significant chronic disease burden.

The intervention targeted a population with an average of two chronic diseases, reaching them in a setting without the time pressures inherent in primary care. The results suggest that the intervention was successful in increasing participants' activation level and that initial increases may be self-reinforcing. Although the average activation level of those who participated in two or fewer group screenings remained largely unchanged over time, participants who attended three or more group screenings increased their activation from before the intervention to 6-month follow-up. The greatest increases in activation were observed in those with the lowest level of activation at baseline. Although overall self-reported physical activity decreased from baseline, which could reflect seasonal variation in physical activity,²¹ participants who attended three or more

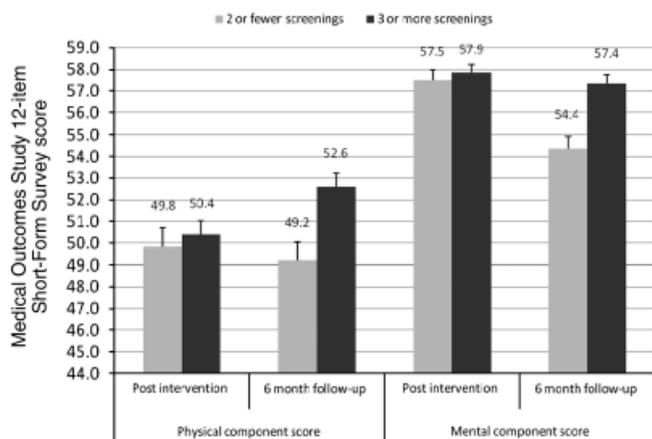


Figure 1. Health-related quality of life according to number of screenings attended.

Table 3. Participant Subjective Perceptions of Change at 6-Month Follow-Up According to Number of Screenings Attended

| Number of Screenings | % | | | | P-Value |
|--|-----------|-------------------------|-------------------------|---------------------|---------|
| | No Change | A Little More or Better | Somewhat More or Better | Much More of Better | |
| How willing are you now to ask your doctor questions about your treatment? | | | | | |
| ≥3 | 1.4 | 13.9 | 68.1 | 16.7 | <.001 |
| ≤2 | 35.7 | 23.8 | 35.7 | 4.8 | |
| How confident are you now that you can ask your doctor questions about your treatment? | | | | | |
| ≥3 | 2.8 | 6.9 | 62.5 | 27.8 | <.001 |
| ≤2 | 38.1 | 31.0 | 28.6 | 2.4 | |
| Have you experienced any changes in how you now think about who is responsible for managing your health? | | | | | |
| ≥3 | 4.2 | 5.6 | 44.4 | 45.8 | <.001 |
| ≤2 | 40.5 | 16.7 | 28.6 | 14.3 | |
| Have you made any changes in what you now do to manage your health? | | | | | |
| ≥3 | 5.6 | 16.7 | 72.2 | 5.6 | <.001 |
| ≤2 | 42.9 | 40.5 | 16.7 | 0.0 | |
| In general, how would you rate your health now, as a result of what you learned in this program? | | | | | |
| ≥3 | 13.9 | 31.9 | 43.1 | 11.1 | <.001 |
| ≤2 | 61.9 | 26.2 | 11.9 | 0.0 | |

group screenings reported significantly more minutes per week walking at both follow-up points and more minutes of vigorous physical activity per week at 6-month follow-up. The results suggest that participants who attended three or more group screenings had better health-related quality of life at 6-month follow-up, in terms of physical and mental health. Nevertheless, these findings should be interpreted with caution. First, although these differences were non-significant, participants who attended more group screenings reported more physical activity at baseline, which could affect the physical component scores. Second, the difference in mental health component scores appeared to result from a drop in scores of those attending fewer screenings, whereas those attending three or more screenings appeared to maintain their gains from baseline. Further research is needed to better understand the relationship between greater activation and quality of life.

The survey items assessing participants' subjective perceptions of change and the open-ended responses from participants reinforce the overall conclusions that these data suggest. The data also suggest that participants who viewed the program on advance directives were more likely to complete an advance directive or intend to do so in the near future. The important question that remains open is whether the self-reported changes observed in this study would translate into improvements in relevant objective measures. Future studies will need to examine whether an activation intervention delivered in a community setting can lead to improvements in measures such as glycosylated hemoglobin, lipids, blood pressure, or physical activity assessed with pedometers.

None of the seniors in either center viewed the video programs outside of group screenings. Although a television and DVD player were provided to both senior centers to enable individual viewing, seniors showed little interest in doing this. This suggests that a facilitator-led group activity is needed to engage seniors with the topic of chronic disease self-management.

There are several additional important limitations to this study. First, the seniors who participated in the study constituted a small sample of the population served by the respective centers, and it is unclear whether they were representative. The follow-up completion rate suggests that the participants were highly motivated, but the follow-up completion rates were equally high regardless of how many group screenings participants attended. Because the intervention was delivered in community senior centers, it was decided that randomization at the individual level was not feasible. Moreover, it was decided that the intervention could not be withheld from one center while it was delivered in the other because of concern that it would not be possible to recruit and retain participants for a study in which there was no intervention. The financial incentive was clearly effective in increasing participation in group screenings, but the sample was not adequately powered to demonstrate differences for each primary outcome variable at the center level. As a result, the primary independent variable—repeated exposure to group screenings—was not randomly allocated, introducing a risk of selection bias into the quasi-experimental study design. The baseline data suggest that participants who attended three or more group screenings were not differently activated to begin with, although they were younger and more likely to be female. Including these confounding variables in the models did not alter the findings, but it is unclear whether some other important unmeasured variable may account for who attended three or more group screenings. These participants may have been more enthusiastic about the intervention to begin with or may have held beliefs that influenced their willingness to participate in multiple group screenings, which in turn could be related to their propensity to become more activated. The decision to divide participants into two groups based on how many group screenings they attended was premised on the fact that repeated exposure to a concept is necessary to increase learning, but potential self-selection bias in the composition of these two groups cannot

Table 4. Sample Participant Responses to Open-Ended Survey Questions

| Participant Demographic Information and Increase in Activation (Level and Absolute PAM Scores) from Baseline to 6-Month Follow-Up | Did you talk to your doctor about something you learned in a video or discussion about a video? | Did you and your doctor decide to make changes to your treatment? | As a result of something you learned, did you make any changes in what you do to treat your condition? |
|--|---|---|---|
| 65-year-old African-American woman Baseline activation level: 4 6-month follow-up level: 4 PAM score: +23.1 points | I was not on a statin, and after watching the video, I decided I wanted to take one to help lower my cholesterol. Also, I changed my PCP because I felt that my old PCP was too arrogant and didn't allow me to ask questions or give my input. So I told him that I did have every right to find a doctor that cares about my needs. | I asked about statins, and my new PCP agreed, and I am now taking a statin. | I took a class for Health Living at Kaiser. |
| 65-year-old African-American woman Baseline activation level: 2 6-month follow-up level: 4 PAM score: +22.4 points | Yes, I talked to my doctor about changing my medication for my heart condition because it was making me feel really tired. I found out that my kidneys were not getting enough blood. Now that I changed the medication, I feel so much better. | I felt more informed and that I knew a little more about side effects to my medications. So I felt like I could have more input in my treatment plan. | Yes, I now ask more questions. I feel like I do have an important role in my care. |
| 64-year-old African-American woman Baseline activation level: 2 6-month follow-up level: 4 PAM score: +35.4 points | We talked about my cholesterol meds and how they were making me feel. He switched me to another kind, and now I don't feel as nauseous as I used to. | I asked my doctor that I wanted him to test me for diabetes. So next week I have a fasting test to take a look at my sugar levels. I feel much more empowered now because I learned so many things that now I write down questions before I see my doctor so that I don't forget. | Yes, I am walking more and testing my blood pressure at least once a day. |
| 68-year old African-American woman Baseline activation level: 3 6-month follow-up level: 4 PAM score: +23.1 points | I mentioned to my doctor that I had seen a video on diabetes and that it really motivated me to exercise more. I asked him what exercises he could recommend for me. Also, I asked him about statins and if I was taking one. | Yes, I found out I was taking a statin already, but my doctor switched me to another med because I was feeling a bit nauseous with the other medication, so I stopped taking it. And since I didn't know what it was for I forgot about it. But now that I learned that I should take a statin, I wanted to make sure I took one that did not upset my stomach. | Yes, I check my blood sugar more frequently. I even brought it with me during my vacation so that I can check my sugars here. I've never done that before. I also have been walking a lot during my trip so that I don't get lazy and stop. |
| 82-year old Caucasian woman Baseline activation level: 2 6-month follow-up level: 4 PAM score: +36.4 points | No | Yes, my doctor decided to put me on cholesterol medication. I told her I would, but that I wanted the lowest dosage, and I made sure I found out what all side effects were before I started taking it. I told her I would take it for three months and see how much it lowered my cholesterol; if it did not lower it significantly, then I would stop taking it and ask for something else. | I exercise a little more. Also, I make sure I take my list of questions to all my appointments. |
| 87-year-old Caucasian man Baseline activation level: 4 6-month follow-up level: 4 PAM score: no change | No | No | I learned that it's alright to disagree with my doctor and to ask him questions if I'm not OK with what he wants me to do. |

PAM = Patient Activation Measure; PCP = Primary Care Physician.

be excluded. Further research is needed to determine whether similar effects would be observed if participants were randomly assigned to repeated exposure to group screenings. The sample also did not have sufficient power to detect dose-response effects; hence future studies should examine what the optimal “dose” of intervention to increase patient activation is.

The video programs used in the intervention focused on multiple chronic conditions that are common in older

adults. Despite the focus on multiple conditions, each program reinforced the message that active self-care improves chronic condition outcomes. It is unclear whether the intervention effects would be greater if only one specific condition had been focused on. Alternatively, by including multiple conditions, the message that active management is important may appear more generalized and therefore more effective in changing beliefs—the most basic cognitive determinants of behavior²²—about the role of the patient in

influencing chronic disease outcomes. The study design also precluded determining whether the observed effects can be attributed to the content of the video programs, the role of the facilitator that led the group screenings, or both. A more-complex experimental design is necessary to answer this question, although it may be that both are necessary. Although the facilitator played an important role in encouraging the seniors to discuss the video programs, at the same time reinforcing the central message of the programs, initially conveying the message of increasing self-management may be more effective using an engaging video program than, for example, using a lecture format.

Future studies using a more-rigorous randomized design will need to confirm the intervention effects observed in this study and whether these will translate into meaningful improvements in clinical outcome measures. Nevertheless, these findings suggest a potentially promising intervention to activate seniors that warrants further investigation for improving chronic disease outcomes.

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