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# Motivating High-Risk Older Adults to Exercise: Does Coaching Matter?

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*The aim of the study was to compare two coaching channels —a combination of telephone and face-to-face coaching (combined phone and face-to-face) versus telephone coaching only (phone)—on exercise performances in a home-based low-intensity program. Multiple regression models were used to examine if the two coaching channels were associated with different 3-month posttest exercise performances. Individuals with the combined phone and face-to-face coaches had better exercise performances at 3-month posttest, compared to those who received phone coaching only. The evaluation suggests that, in a home-based, low-intensity training program that has been demonstrated to benefit high-risk, ethnically diverse older adults, face-to-face coaching appears to be a more powerful motivator than a phone-based approach only.*

*KEYWORDS face-to-face coaching, Healthy Moves, high-risk older adults, phone coaching, physical activity*

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## INTRODUCTION

During the past decade, a variety of programs have been developed to encourage physical activity among older adults, improve overall health, and promote functional independence. The number of older adults engaging in regular physical activity, however, remains low. About 75% of adults aged 65 and over do not meet the recommended physical activity level (Kruger, Carlson, & Buchner, 2007). Barriers to improving older adults' physical activity include lack of motivation to initiate exercise and difficulty maintaining the motivation for adherence (Brawley, Rejeski, & King, 2003).

Despite these problems, some approaches have shown promise. For example, physical activity interventions using tailored cognitive-behavioral strategies based on social learning/social cognitive theory (Bandura, 1986) and the trans-theoretical model (Prochaska & DiClemente, 1983; Prochaska, DiClemente, & Norcross, 1992) have been effective in increasing initial and longer term physical activity participation among older adults (King, Rejeski, & Buchner, 1998; Marcus et al., 2006). These effective cognitive and behavioral strategies included readiness to change, goal setting, self-monitory, feedback, and social support. Interventions designed to deliver advice and support to older adults have used a range of communication channels—including traditional face-to-face on-site instruction (Stewart et al., 1997), mediated instruction such as the telephone (King et al., 2000; Stewart et al., 2001), or a combination of both (Jette et al., 1999). Although face-to-face interventions have the ability to provide individualized immediate feedback, personalized contact, and concentrated information, barriers exist in administering face-to-face interventions—including time limitations, cost, and limited access (Marcus, Owen, Forsyth, Gavill, & Fridinger, 1998). Studies indicate that older adults prefer home-based physical activity interventions with some level of instruction (Wilcox, King, Brassington, & Ahn, 1999; King et al., 2000). Ongoing telephone supervision of home-based physical activity, however, has been shown to be an effective alternative strategy to face-to-face on-site instruction in promoting ongoing exercise adherence (King et al., 1998; King, 2001). For example, inclusion of brief telephone contacts along with initial face-to-face intervention enhanced adherence rates in a home-based program of physical activity (Jette et al., 1999).

Although mediated interventions, delivered via phone or print, have the potential to reach underserved populations at low cost (Marcus et al., 1998), these interventions have not targeted high-risk older adults—such as frail, homebound elders, and racial/ethnic minorities (King, 2001). The Healthy Moves for Aging Well program (Healthy Moves) was designed to address this gap by targeting nursing home certifiable older adults in a Medicaid waiver program. "Nursing home certifiable" refers to Medicaid regulations that allow individuals who qualify for nursing facility level of care to be served in the

community (Eng, Pedulla, Eleazer, McCann, & Fox, 1997). An initial study of the outcomes of Healthy Moves focusing on falls, fear of falling, depression, and pain indicated that the program significantly reduced the number of falls and participants' overall level of pain (Yan, Wilber, Wieckowski, & Simmons, 2009). Building on this work, the present study examines two types of intervention coaching channels delivered by volunteer coaches to carry out the program: telephone coaching only (phone) and a combination of face-to-face on-site instruction and telephone coaching (combined phone and face-to-face). The aims of the study were to determine (a) if the program could motivate frail older adults to initiate and sustain two exercises: one targeting upper-body strength and the other one targeting lower-body strength; and (b) to compare the two coaching channels on changes in exercise performances.

## METHODS

The Healthy Moves program was designed and piloted by Partners in Care Foundation, a non-profit organization with an extensive history in testing, adapting, and disseminating evidence-based models. It was evaluated by an external evaluation team at the University of Southern California. Healthy Moves began on July 1, 2004 and was completed on January 31, 2008.

### Study Participants

Detailed information about the study participants has been discussed elsewhere (Yan et al., 2009). Briefly, inclusion criteria included being aged 65 years or over; having two or more activities of daily living impairments, or at least one deficiency in activity of daily living plus cognitive impairment; willingness to participate; and cognitively capable of following instructions. Participants were ineligible if they were bed-bound or severely cognitively impaired. Caregivers in the home were not required. However, if participants lived alone or had no caregiver available, they needed to be able to stand unassisted in order to exercise alone safely.

Participating site care managers were responsible for recruiting participants. Financial assistance was provided to the participating sites and their care mangers. Of the 865 participants who were initially recruited into the study, a total of 518 (73.2%) were included in the pretest analysis. Three hundred thirty-eight (65.3%) completed the study.

### Study Design and Procedure

The Healthy Moves evaluation included a pretest and 3-month posttest. The study was approved by the institutional review boards at Partners in Care

Foundation and at the university conducting the evaluation. In addition, all study participants completed a written informed consent form.

As few of the existing physical activity programs have targeted high-risk, nursing home certifiable populations in home-based settings, no optimal types of physical activity or exercise have been recommended for this population. For the Healthy Moves program, two simple low-intensity exercises—arm curl and seated step-in-place adapted from the Senior Fitness Test (SFT; Rikli & Jones, 1999)—were used to improve participants' upper and lower body strength. Due to the frailty and safety concerns about falls, participants performed the arm curls using 1-pound weight and the steps-in-place exercise in the seated position. Participants were encouraged to complete the exercises three to five times a week on their own at home or in the company of their caregiver or family member, 5 to 10 minutes each time, twice per day, in the morning and in the afternoon.

Healthy Moves used a combination of cognitive and behavior change strategies to help participants develop behavioral skills needed to build the low-intensity physical activity into their daily lives. A behavior change counseling method called Brief Negotiation (Runkle, Osterholm, Hoban, McAdam, & Tull, 2000) was used to evoke and support participants' internal motivation to change. The central tenet of the brief negotiation model is that health care providers can not change clients' behavior until clients decided to change for themselves (Runkle et al., 2000). The brief negotiation model offers a strategy for providers to lower resistance by explaining and encouraging participants' readiness to change and providing personal supports. Readiness to change was measured using a ruler. Participants were asked to indicate on the ruler their response to the following question—"On a scale from 0 to 10, how ready are you to change?" —where "0" is *not ready* and "10" is *very ready*. In addition, feedback, social supports, and helping participants set realistic goals were used to encourage participants to adhere to the intervention. The goals included rising from a chair or toilet, holding a grandchild, lifting toes to avoid tripping, getting the mail, doing grocery shopping, pouring a drink from a carton, and walking in the home without falling.

Volunteer coaches were recruited and trained to deliver counseling and to motivate participants to change their behavior. Potential volunteer coaches were selected based on their interests, ability to participate in the 2-day training session, commitment to completing the program, and perceived ability to lead and motivate participants. Background in health or fitness was not required. Strategies employed in recruiting coaches included word of mouth, Internet postings, newspaper articles, agency newsletters, and volunteer pools at the four participating sites. No financial incentives or complimentary rewards were offered; 97 volunteer coaches were recruited.

Prior to implementing the Healthy Moves program, care managers at the four participating sites and two types of volunteer coaches (phone and combined phone and face-to-face) attended a mandatory training workshop to learn fundamental issues related to the program—including instructions about the exercise, safety guidelines, barriers to behavior change, and techniques for using the brief negotiation. Face-to-face volunteer coaches taught the participants the exercises in person and made home visits or phone calls on scheduled appointments. Where phone coaching was used, participating site care managers taught the exercises and volunteer coaches made motivating phone calls without any face-to-face contacts with the participants. Both types of volunteer coaches were asked to contact participants weekly for the first 2 months and biweekly for the 3rd month. During each contact, the coach monitored the participant's progress with the exercises, engaged participants in goal-setting discussions to support adherence, encouraged the participate to come up with solutions to challenges, offered social support and recommendations when appropriate, and built confidence in the participants' ability to make positive changes. Volunteer coaches and participants were matched based on their cultural and language backgrounds. Seven different languages were used in the intervention: English, Spanish, Russian, Korean, Armenian, Chinese, and Farsi.

## Statistical Analysis

Performance measures for the two exercises—number of arm curl in 30 seconds and number of seated steps-in-place in 2 minutes—were taken at the pretest and 3-month posttest. Paired *t*-tests were employed to analyze changes in the exercise performances from pretest to posttest for the total sample and by the two delivery channels.

To compare the two delivery channels, two multiple regression models were conducted, controlling for pretest exercise performances, age, gender, race, and functional status measured by number of limitations in activities of daily living (ADLs; Katz, Ford, Moskowitz, Jackson, & Jaffe, 1963) and in instrumental activities of daily living (IADLs; Lawton, & Brody, 1969). As the distribution of the posttest exercise performances was non-linear, square root transformation was performed. The ADLs included dressing, eating, bathing, toileting, transferring from bed to chair, and grooming. The IADLs included using the telephone, laundry, transportation, shopping, preparing meals, housekeeping, taking medications, and handling finances. ADLs and IADLs were determined by a comprehensive case management assessment given by a nurse and/or social worker. The purpose of the assessment was to determine if participants were qualified to be in a Medicaid waiver program. Missing values for ADLs and IADLs (10%) were imputed by matching the response patterns of persons with complete data to persons with missing data.

# RESULTS

## Participant Characteristics

Table 1 shows selected sociodemographic characteristics of participants at the pretest. The mean age was 80 years (standard deviation [SD] 7.3, range 65–103 years); 84% were female; more than 40% were Hispanic; almost half were widowed. Significant variation in delivery channels was found across the four sites. Also differences were found among those using phone and combined phone and face-to-face coaching at pretest. Compared to participants who received phone coaching only, participants who received the combined phone and face-to-face instruction were older; a higher percentage were female, white, not married, and had the highest ADL limitations

**TABLE 1** Characteristics of the Sample at Pretest

| Characteristics | Total ($n = 518$) | Combined phone and face-to-face coaching ($n = 118$) | Phone coaching ($n = 400$) | Completers ($n = 338$) | Non-completers ($n = 180$) |
|---|---|---|---|---|---|
| Age in years, Mean (*SD*) | 80.1 (7.25) | 82.70 (7.03) | 79.46 (7.16)*** | 80.4 (7.3) | 79.79 (7.3) |
| Gender, % | | | | | |
| Men | 16.23 | 10.17 | 18.00* | 14.5 | 19.4 |
| Women | 83.78 | 89.83 | 82.00 | 85.5 | 80.6 |
| Race/Ethnicity, % | | | | | |
| White | 25.48 | 58.47 | 15.75*** | 24.9 | 26.7*** |
| African American | 22.20 | 13.56 | 24.75 | 27.8 | 11.7 |
| Hispanic | 40.54 | 19.49 | 46.75 | 36.7 | 47.8 |
| Other | 8.11 | 7.63 | 8.25 | 6.8 | 10.6 |
| Unknown | 3.67 | 0.85 | 4.50 | 3.9 | 3.3 |
| Marital status, % | | | | | |
| Married | 21.24 | 17.80 | 22.25** | 19.5 | 24.4 |
| Not married | 74.13 | 82.20 | 71.75 | 76.1 | 70.6 |
| Unknown | 4.63 | 0.0 | 6.00 | 4.4 | 5.0 |
| Limitations in ADLs, % | | | | | |
| 0–3 | 9.65 | 15.26 | 8.00*** | 11.5 | 6.1* |
| 4 | 14.09 | 3.39 | 17.25 | 16.0 | 10.6 |
| 5 | 37.84 | 28.81 | 40.50 | 38.8 | 36.1 |
| 6 | 28.96 | 49.15 | 23.00 | 25.7 | 35.0 |
| Unknown | 9.46 | 3.39 | 11.25 | 8.0 | 12.2 |
| Limitations in IADLS, % | | | | | |
| 0–5 | 9.26 | 12.71 | 19.6*** | 11.3 | 5.5*** |
| 6 | 11.39 | 10.17 | 24.4 | 14.5 | 5.6 |
| 7 | 27.99 | 27.97 | 33.9 | 28.7 | 26.7 |
| 8 | 41.51 | 45.76 | 13.4 | 37.3 | 49.4 |
| Unknown | 9.85 | 3.39 | 8.7 | 8.3 | 12.8 |

*Note.* *$p < .05$. **$p < .01$. ***$p < .001$.

(six) and IADL limitations (eight). Compared to those who completed the intervention, participants who did not complete the study were more likely to be Hispanic, and had more ADL and IADL limitations. Although a higher percentage of people who received phone coaching dropped out of the study, compared to those who received the combined phone and face-to-face coaching, the difference was not statistically significant ($p = .19$).

### Changes of Exercise Performances

Table 2 shows the changes of exercise performances among participants who completed the study from pretest to posttest overall. Participants significantly improved their number of arm curls in 30 seconds ($p = .03$). In contrast, their number of seated step-in-place in 2 minutes significantly declined from pretest to posttest ($p = .02$). Significantly different patterns were found, however, in changes of exercise performances by the two delivery channels. Improvements in performances for upper and lower body exercises were found among participants in the combined phone and face-to-face coaching group ($p < .01$). Among participants who received phone coaches, no significant improvement was found in the mean number of arm curls in 30 seconds from pretest to posttest ($p = .94$) and mean number of seated steps-in-places in 2 minutes significantly declined ($p < .001$).

Two multiple regression models were conducted to determine if the two different coaching channels associated with the posttest exercise performances remained, after controlling for pretest exercise performances, age, gender, race/ethnicity, ADLs, and IADLs (see Table 3). Significant coaching differences were found in predicting the posttest exercise performances. Compared to phone coaching, combined phone and face-to-face coaching was associated with a significantly higher number of both arm curls and seated steps-in-place at the posttest intervention.

## DISCUSSION AND CONCLUSION

Because few exercise programs currently target community-dwelling older adults with high levels of impairments, there is a great need to create and develop appropriate intervention methods and strategies to encourage frail older adults to be physically active (Prohaska et al., 2006). The current study was undertaken to determine if a modest, home-based, low-intensity strength training program affected the upper and lower body exercise performances of high-risk older adults with at least two ADL impairments. Using cognitive and behavioral strategies delivered by volunteer coaches, a high completion rate was achieved among an at-risk older adults sample, with more than 65% of participants completing the study.

**TABLE 2** Changes of Exercise Performances From Pretest to Posttest

| | Arm curl | | | Seated steps-in-place | | |
|---|---|---|---|---|---|---|
| | Total sample | Combined phone and face-to-face coaching | Phone coaching | Total sample | Combined phone and face-to-face coaching | Phone coaching |
| *n* | 326 | 81 | 245 | 283 | 77 | 206 |
| Pretest, mean (*SD*) | 15.26 (7.31) | 14.44 (5.98) | 15.53 (7.69) | 44.57 (31.85) | 37.88 (26.64) | 47.07 (33.30) |
| Posttest, mean (*SD*) | 16.06 (7.47) | 17.54 (6.34) | 15.57 (7.75) | 40.17 (31.40) | 47.86 (32.07) | 37.29 (30.74) |
| *t* (*p*-value) | 2.14 (.03)* | 5.57 (< .0001)*** | 0.07 (.94) | −2.39 (.02)* | 3.33 (.001)** | −4.52 (< .0001)*** |

*Note.* *Significant change from pretest to 3-month posttest at the $p < .05$ level. **Significant change from pretest to 3-month posttest at the $p < .01$ level. ***Significant change from pretest to 3-month posttest at the $p < .001$ level.

**TABLE 3** Multiple Regression Models Predicting Posttest Arm Curls and Seated Steps-in-Place

| | Model 1: Posttest square root arm curls ($n = 313$) | | Model 2: Posttest square root seated steps-in-place ($n = 273$) | |
|---|---|---|---|---|
| Independent variable | *b* | *SE* | *b* | *SE* |
| Combined phone and face-to-face coaching (vs. phone coaching alone) | 0.37 | 0.11** | 1.05 | 0.33** |
| Pretest arm curls | 0.07 | 0.006*** | – | – |
| Pretest steps-in-place | – | – | 0.04 | 0.004*** |
| Age in years | −0.01 | 0.006 | 0.01 | 0.02 |
| Female | 0.09 | 0.12 | 0.02 | 0.36 |
| Race: (vs. White) | | | | |
| African American | 0.08 | 0.12 | 0.11 | 0.37 |
| Hispanic | −0.16 | 0.12 | −0.79 | 0.35 |
| Other | −0.22 | 0.17 | −0.57 | 0.53 |
| ADL limitations | −0.03 | 0.37 | 0.07 | 0.12 |
| IADL limitations | −0.09 | 0.05* | 0.03 | 0.13 |
| Missing ADL limitations | −0.04 | 0.15 | −0.09 | 0.49 |
| Intercept | 4.42 | 0.56*** | 2.49 | 1.67 |

*Note.* *$p < .05$. **$p < .01$. ***$p < .001$.

Previous studies have suggested that phone coaching is an effective method of motivating participants to be physically activity in home-based exercise programs (King, Haskell, Young, Oka, & Stefanick, 1995). Results from the present study, however, show that, compared to those coached via phone alone, participants who received the combined phone and face-to-face coaching did significantly better in their exercise performances. One potential explanation for the difference was that participants who experienced the combined phone and face-to-face coaching may be more willing to adhere to the exercise regiment due to their in-person contacts with their coaches. Previous studies suggest that intervention channels with in-person social connectedness work better than those without such contact, such as telephone versus print delivery (Marcus et al., 2007).

It is important to recognize several limitations in the study. First, Healthy Moves is a community-developed pilot study that used a single study group. Therefore, the intervention needs further testing using a randomly controlled trial (RCT), to control for extraneous factors which may have influenced the change in exercise performances. This study was conducted among diverse frail elders enrolled in a Medicaid waiver program in a large urban city and may not be generalizable to other populations and settings. Second, although the improvement in exercise performances among participants in the combined phone and face-to-face coaching group

was statistically significant, the level of change required to achieve and sustain meaningful clinically change is unclear; thus, these findings need to be interpreted cautiously. The third limiting factor is in the collection of data. Some outcome data (exercise performance measures) were collected by those conducting the intervention in the case of face-to-face coaches, which can potentially introduce bias. Future studies should include independent measures of performances by an outside evaluation team. Fourth, the languages and ethnicities of the volunteer coaches were not tracked in the study. Finally, the exercises used were adapted from the SFT (Rikli & Jones, 1999) originally developed as a fitness measure and not as an exercise program. These measures were reviewed by an expert panel, which determined they were appropriate for use with this population. Next steps should include a program that adds additional exercises over time as performance improves.

As one of the first evaluations of a home-based exercise intervention with a nursing home certifiable sample, Healthy Moves achieved positive improvements. The results from the current study show that a low-intensity strength training program could motivate high-risk older adults to improve performances in upper and lower body strength. Face-to-face coaching appears to be a more powerful motivator than a telephone-based approach only. The evaluation suggests that, for this population, face-to-face contacts may be worth the additional costs to ensure a positive outcome. Positive findings from the pilot study support taking the evaluation to the next level, using additional sites and a randomly selected control group to compare how coaching affects performances in a sample of very frail older adults.

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