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Feasibility of integrating the "Healthy moves for aging well" program into home care aide services for frail older adults

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The purpose of the study was to assess the feasibility of implementing simple, safe, non-equipment evidence-based movements (Healthy Moves for Aging Well program) using an affordable and sustainable homecare-aide based delivery model that reaches the maximum possible number of frail older adults living at home in Illinois. Two local agencies were asked to identify two experienced home care aides and two inexperienced home care aides (n=8). Each home care aides delivered the Healthy Moves to four clients (n=16). Eight home care aides visited the client in the home and were asked to deliver the Healthy Moves program on a regular basis for a four-month time period. Outcome measures included a pre-and post- survey, a functional fitness test (older adults), and interviews. Evaluation procedures focused on older adult participants, homecare aids, and sites. The results showed that both interview and survey data revealed that most participants including older adults, home care aides, and site directors had a positive perception and high satisfaction with the program. Specially, 100% of older adult participants reported that they would recommend the program to others. Additionally, seniors and home care aides reported that they enjoyed working with each other on the program and both site directors reported that dissemination of the program in the State of Illinois employing home care aides was feasible and acceptable. Our study results indicate that Healthy Moves for Aging Well could be safely and successfully be disseminated to frail older adults in the State of Illinois.

Keywords: Evidence-based physical activity program, Behavior change, Frail older adults

INTRODUCTION

Physical activity is one of the most powerful health interventions for older adults and can improve seniors' ability to function and remain independent in the face of health problems. Several substantive recent reviews are available and provide excellent summaries of the benefits of participating physical activity. For example, the American College of Sports Medicine (ACSM), in conjunction with the American Heart Association (AHA), recently published physical activity and public health recommendations for older adults (Nelson et al., 2007). The ACSM/AHA recommendations conclude that regular physical activity acts similarly in middle-aged and older adults by reducing the risk of cardiovascular disease, stroke, hypertension, type 2 diabetes mellitus, osteoporosis, obesity, colon cancer, breast cancer, anxiety, and depression (Haskell et al., 2007). Furthermore, the ACSM/AHA recommendations note that among older adult populations, there is substantial evidence that physical activity reduces risk of falls and injuries from falls (American Geriatrics Society, British Geriatrics Society, and American Academy of Orthopaedic Surgeons Panel on Falls Prevention, 2001; Christ and Ross, 2010) prevents or mitigates functional limitations (Keysor, 2003) and is effective therapy for many chronic diseases. Additionally, the research shows that muscle strength and functional mobility can potentially be restored with great benefit to the frail population, even those in their nineties (Fiatarone et al., 1994). Despite the clear evidence that physical activity has tremendous health benefits, few programs have been developed that apply these findings to frail older

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adults for application in their homes. Existing evidence-based physical activity programs tend to be of moderate-to-high -intensity, unsuitable for frail seniors with limited resources.

Few programs, if any, involve home care aides, who regularly visit home-bound seniors and provide housekeeping and routine personal care services. Home care aides (HCAs) assist homebound seniors with housekeeping and routine personal care services in the home. They have unique access to those hard-to-reach seniors in order to increase well-being and quality of life. However, HCAs' potential abilities have been underutilized.

In Illinois, "home care aides" provide assistance with household tasks such as cleaning, planning and preparing meals, doing laundry, shopping and running errands. HCAs also assist clients with personal care tasks such as dressing, bathing, grooming and following special diets. The physical activity component of Healthy Moves for Aging Well is an evidence-based program and it consists of three movements taken from the Senior Fitness Test (Rikli and Jones, 1999) that are linked to functional activities that are needed on a daily basis to live independently at home. Through adaptation of this model to the homemaker delivery setting, the project can potentially improve functional fitness levels, reduce depression and fall risk, and improve well-being and quality of life for frail and sedentary older adults. A key feature of the "Healthy Moves" program is that it includes only very low-intensity physical activities that are already performed on a daily basis by most home-bound seniors, accordingly, participation in the study was not associated with any additional risk beyond those experienced in everyday life.

The RE-AIM model (Glasgow et al., 1999) was employed as a conceptual framework for evaluating the feasibility and outcomes of the Healthy Moves program. RE-AIM addresses the following: reach (proportion of the target population that participates in an intervention); efficacy (success rate if implemented as recommended); adoption (proportion of settings, practices, and plans that adopt this intervention); implementation (extent to which the intervention is implemented as intended in the real world); and maintenance (extend to which a program is sustained over time). Our study focuses on the adoption and implementation portions of the model. Our overall goal was to determine if Healthy Moves program could be safely and effectively employed with frail, homebound older adults by HCAs. The perceived usefulness of Healthy Moves was measured by the site directors, HCAs, and older adult participants.

The purpose of this study was to assess the feasibility of implementing simple, safe, non-equipment evidence-based movements (Healthy Moves for Aging Well program) using an affordable and sustainable homecare-aide based delivery model that reaches the maximum possible number of frail older adults living at home but who are at risk for nursing home admission.

MATERIALS AND METHODS

Healthy moves for aging well program

The Healthy Moves for Aging Well evidence-based physical activity program was developed by Partners in Care Foundation in 2002 with guidance from a Los-Angeles-based Regional Interdisciplinary Team of academic, clinical, and community experts. The Healthy Moves program is an evidence-based intervention program that consists of two major components: a simple physical activity intervention modeled and adapted from the Senior Fitness Test work of Rikli and Jones (1999) and a lifestyle behavior change counseling method called Brief Negotiation that was developed by behavior change experts Prohaska and DiClemente (1983).

Recruitment

The participants who quality for the Older Americans Act funded home visit program in the State of Illinois for the study were identified by Help at Home and Family Service. Help At Home is a for-profit home care agency committed to enhancing the quality of life of clients and that provides an alternative to a nursing home. Help at Home and its sister company, Oxford Healthcare, have 64 locations in seven states.

Family Service is a private, non-profit, non-governmental agency serving Champaign County, Illinois since 1911. At each site, the agency director recruited participants in consultation with their HCAs and case managers. Both HCAs and case managers helped the directors to identify potential clients to participate, and asked clients about their interest and willingness to participate in the study.

In the State of Illinois eligibility to participate in the "homecare Aide" program is determined by "case-managers" who are health-professionals (nurses, physical therapists, occupational therapists etc.) charged with developing an appropriate, individualized care-plan for all persons enrolled in Older American's Act funded care programs. As part of the care-plan development process, case-managers worked with the homemaker agencies to add or exclude the 'healthy moves" activities from the individual treatment plans developed for each senior participating in the project. This approach was n selected because the case-managers

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are the legally-responsible individual charged with the development of care-plans for older adults under the Illinois home-maker program. It is also a realistic and sustainable model that could be efficiently replicated in the event that this demonstration project is successful. Reasons for exclusion of participants from the "healthy moves" activities could include; (i) inability to comprehend and/or follow instructions about the program; (ii) inability to perform any of the three activities included in the healthy moves program.

Procedures

Two local agencies (Help at Home in Denville and Family Service in Champaign) were asked to identify four HCAs (n = 8). Each HCAs delivered the Healthy Moves to four clients (n = 16). HCAs attended a training section to deliver Healthy Moves. Healthy Moves for Aging Well is a simple and safe in-home physical activity intervention developed and tested by Partners in Care to enhance the activity level of frail high-risk sedentary seniors living at home.

In the training, attendees learned an evidence-based life style change counseling method called Brief Negotiation. This method engages the client in identifying a meaningful personal goal that could be addressed by the intervention. They also learned how to work with the client to introduce and sustain Healthy Moves in a way that is personally tailored to the client's goals, resources, barriers, and individual lifestyle. Following the Brief Negotiation training, all HCAs participated in the physical activity training. In the training attendees were trained to teach the clients the physical activity movements (three chair bound movements) while utilizing Brief Negotiation techniques as a motivational tool.

The movements were ARM CURLS (Sit in a comfortable position. Place a 1 pound weight [soup can, water bottle] in the right hand. Resting the elbow at the hip, bend at the elbow and touch the soup can to the shoulder. Slowly lower the weight, returning the hand to its starting position. Repeat with the left arm. Work up to 15 to 20 arm curls two times a day), ANKLE POINT&-FLEX (Sit in a comfortable position. Lift and extend right leg, then flex the toes to the roof. Repeat on left leg. Work up to 30 sec on each foot three times a day), and SEATED STEP-IN-PLACE (Sit in a stable chair and move the legs by slowly marching them in place. Lift them only an inch off the ground. Work up to 1 min once a day). To reinforce the training, researchers provided additional trainings and ongoing telephone support for the homemakers when needed. HCAs visited the client in the home and were asked to deliver the Healthy Moves program on a regular basis for a four-month time period.

Data sources and measures

Evaluation procedures focused on older adult participants, HCAs, and sites.

1) Site evaluation

Two site directors were asked a series of open-ended questions. For example, they were asked to describe the composition of his or her site; whether or not the Healthy Moves program was a benefit to their program; their satisfaction with the Healthy Moves; feedback from senior participants and HCAs; any concerns about the program; and whether or not they would like to continue with the Healthy Moves program.

2) Homecare aide evaluation

The homecare aide evaluation utilized surveys and an interview designed to their experiences and attitudes; to rate the quality of the training; to rate a ease of learning and implementing the program.

(1) Surveys

Participant baseline surveys asked respondents for demographic information, contained questions about their experiences and attitudes regarding physical activity, and their anticipated benefits from participating in the Healthy Moves program. The follow-up surveys asked them to evaluate their interest in the Healthy Moves program. Also, HCAs were asked whether or not their clients benefited from the Healthy Moves program.

(2) Interview

One formal interview was conducted with each homecare aide. The questions were as follows: What aspects of the program have had the greatest impact on your clients?; How effective do you think the program has been in increasing the physical activity level of your clients?; How effective do you think the program has been in enhancing the health and quality of life of your clients?; What reactions do your clients have to the program?; How well did your clients adopt the new movements?; What were your concerns about the program?

3) Older adult participant evaluation

(1) Functional ability outcome measures

The following data were collected prior to and upon completion of the study:

Chair stand: This test measures participants' lower body strength and endurance. Participants began the test seated in a chair with the hands crossed over the chest and the feet shoulder width apart and flat on the floor. Participants were scored on the total number of times they can stand up from the chair in 30 sec.

Arm curl: This test measures upper body strength and endurance. Participants will be seated in a chair with a weight placed in the dominant hand. Female participants will lift 5 pounds and male participants will lift 8 pounds. Starting with the arm in an extended position, they will be asked to complete as many curls as possible in 30 sec.

Chair Sit & Reach: This test is designed to assess lower body, primarily hamstring, flexibility. The participant sits on a standard chair with one leg extended and one bent. The participant slowly bends forward sliding the hands forward as far as possible along a yardstick position by the foot of the extended leg. The final position, with fingertips even, must be held for two seconds. The score is the distance that the middle fingertips reach on the yardstick to the nearest 1/2 inch.

(2) Surveys

Participant baseline surveys asked respondents for demographic information and contained questions about their physical activity related behaviors and expected benefits for the participating in the Healthy Moves program. Follow-up questions included participants' overall enjoyment of the program, enjoyment of each movement, their health statues, and they were asked to answer how much they enjoy working with their HCAs on the program.

(3) Interview

One formal interview was conducted with each participant. An interview guide was developed to ensure that the same basic lines of inquiry were pursued with each person interviewed. The guide also helped to elicit meaningful responses to the major research questions posed in this study.

Researchers administered all instruments to the sites, HCAs, and older adult participants when they begin the Healthy Moves program. Follow-up surveys and functional ability measures were administered four months later.

Analysis

All data obtained from the measures were processed using SPSS (ver. 21.0) statistical software. Descriptive statistics including mean and standard deviation were employed to describe the survey data. A paired t test was conducted to analyze the mean changes in functional abilities from pretest to posttest. Inductive content analysis was used to analyze the interview data. All the verbatim transcripts were reread to ensure that the categories were representative of the original material. Sources of triangulation were literature reviews related to older adults and physical activity, health professionals, and the use of peer researchers as an external audit source.

RESULTS

Sites

Agency directors from two sites participated in the interview. Overall, both site directors reported the Healthy Moves program was beneficial and worked well with HCAs and their clients. They expressed positive beliefs regarding the value of the easy and safe aspects of the program. Directors reported that implementing the Healthy Moves program was feasible and beneficial to their clients.

"I think they like that it's simple and yet can be effective. The moves are simple enough that there's no danger for most people and it doesn't require a lot of reporting for them. All those things are in its favor, as well as the fact that it works." (CD-R).

"I'm very satisfied. It doesn't require any equipment on site, doesn't require staff to carry anything with them or be there very much longer. I don't think it would even have to change the amount of time on a care plan. It was new water for us because we'd never done anything like that before. And I think it was good for everybody, so…it was good for us." (DD-T).

Also, one of the directors said "if the program is the part of each client's care plan, implementation part is relatively easy." And she added that "I think the more experienced HCAs assimilated the program easier than some of the new ones. However, because in this field it's hard to get long-term experience staff, it can be an obstacle to maintain the program. Even though both directors did not have any concerns and did not observe any resistance about the program to adopt and implement, the director indicated high turnover rates of HCAs could be a major problem if they had to deliver the program continuously to older adults.

Home care aides

Eight HCAs from two sites completed baseline surveys. Two of eight HCAs could not participate in the study because their matched older adult clients were not available due to a sudden death unrelated to the study and a relocation. The HCAs who finish the program (n = 6) were female (100%) and primarily Cauca-

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sian (66.6%), with a mean age of 52.5 yr (range = 37-73 yr; SD = 16.3).

Six surveys were completed by HCAs. Those remaining in the program were surveyed at 4 months and rated their satisfaction with their job as a homecare aide favorably (excellent and good). They also expressed strong positive feelings about the program. In response to the question, "In general, how interested were you in the program?" four participants said they are very interested, one person said she is somewhat interested, only a person was not interested in the program. From their perspectives, they reported that all older adult clients were positively interested in the program and they noticed that their clients were better able to perform daily tasks, had improved confidence, improved mood, and improved strength. This evidence was consistent with the interview data from the HCAs who mentioned that the program had significantly influenced their clients' overall health.

"She's doing a lot. She is getting up, moving about more instead of just sitting in one position. It hasn't changed significantly, but you see a change." (CH-M).

"I've been taking one of my clients to the store and before she was not going to the store. She would send her family or whatever, but now every week we go to the store. But she has to hold onto me and once she's in the store she can hold onto a cart and she can push the cart alone, but I walk alongside her. And she gets her groceries and comes back and she's happy about that! She wasn't doing that at first, so now we go to the grocery store. I take her to the drug store- she goes and picks up her make-up and, I mean, she does her own personal stuff. She goes to the cleaner's, we drop her clothes off. She wasn't doing that at first" (DH-N).

In terms of managing their current caseloads while adding the program, all HCAs did not mention any negative aspects associated with incorporating the program into their workload (strongly agree = 1; agree = 4; neutral = 1). The interview data more explicitly reveal that because the program was very simple and easy to deliver, they liked having the program added to their work schedule. HCAs mentioned,

"The program was easy. It wasn't hard. They understood it. It wasn't a lot of different directions or ways for them to do it. Very simple. Easy for them to accept, easy for them to do. I don't mind to incorporate this in my clients' care plan" (CH-H).

"It was good. It helped me because exercising with them helped me to exercise me. I didn't have any concerns. I thought it was something good for them as well as myself. I thought it was pretty good" (DH-A).

Older adult participants

Of the 16 participants enrolled, 3 were unable to complete the full study due to several reasons, including poor health, relocation, and loss of interest. At baseline, those 13 seniors who finished the program had a mean age of 76.8 yr ($range_{age}$ = 60-92 yr; SD = 11.4); 11 of them (84.6%) were women; 10 of them were widows/widowers. Eleven participants were Caucasian, and 2 were African American.

Similar to the HCAs, at post-test, participants were very satisfied with the healthy moves program. In response to the questions, "Please rate your overall enjoyment of the Healthy Moves program during the past 16 weeks," 12 participants (92.3%) stated that they either "very much enjoyed" or "somewhat enjoyed" the program. Thirteen seniors (100%) said that they would recommend the program to other older adults. The survey data were consistent with interview data. Older adults mentioned,

"I really liked it because it kept me moving more, exercising more and I just really enjoyed it. I think this program is important for a lot of people" (DO-A).

"I was surprised that you can take a can of soup and do the exercises and sit in a chair and do the leg exercises. It really, really helped me. It's good program for others. So I recommended this program for others" (CO-J).

"I think it's a very good program and if it hadn't come my way I wouldn't have been doing those exercises. Also I think this program is good for many people" (CO-L).

Nine participants (69.2%) commented that their health had changed as a result of the Healthy Moves program. In the interview data participants explained,

"I feel that it has helped me, maybe not all the way, but I do feel pretty good about it" (CO-N).

"Oh, I can pick up things on the floor now, which I couldn't before. I can walk further. I don't know, it just seems like I'm doing a lot better" (CO-D).

"I think it's helped me to do more things. It helps me do better. Well, I can do lots more things than I could before: pick up things, move things. I can move around the house. Oh! I don't have to touch the walls anymore when I walk and when we first started I had to touch everything. I had to touch this, touch that. Once in a while I do; it's when I've real tired and haven't had enough sleep or something like that, I will, but usually I don't touch anything anymore" (DO-E).

"I think that what you're doing is showing some proof that these small things at home can help. I don't have to get out and walk and do all these other things. That even as limited as I was

Table 1. Functional ability outcomes

Variables	Pretest, mean (SD)	Posttest, mean (SD)	t	*P*
Chair stand	5.08 (3.378)	5.85 (4.298)	-0.720	0.486
Arm curl	7.38 (3.595)	11.31 (7.192)	-2.654	0.021*
Chair Sit & Reach	-5.077 (5.8161)	-2.577 (4.7373)	-2.050	0.063

*Significant change from pretest to 4-month posttest at the $P<0.05$ level.

doing it was helping a lot" (DO-M).

Nine participants (69.2%) reported that they enjoyed working with their homecare aide on the program and ten older adult participants (76.8%) reported that working with their homecare aide motivated them to exercise more regularly. Similarly, ten people (76.8%) felt that their homecare aide provided enough information and assistance to do the exercise and that they regularly performed the movements from the program. Related to the three major movement (arm curls, ankle point & flex, and seated step-in-place), no one reported that they did not like any of the movements. One of the participants specifically commented in her interview that she did not have any dislike about three movements in the program.

"I don't have any dislikes at all (about the movements). I'm just glad you brought it to my attention, because I don't do any physical activity at all. It just helped me to relax especially when I did the leg exercises" (DO-S).

Using paired t tests for the 13 participants who completed the functional test at baseline and follow up, in Table 1 we shows a statistically significant improvement in their number of arm curls in 30 sec ($P=0.021$) following their participation in Healthy Moves program. Even though, we found no significant differences in the other scale scores of chair stand and chair sit & reach, we observed some trends toward improvement in both functional abilities. There were no serious injuries or adverse events reported during 4 months and no participants discontinued the program as a result of injury.

DISCUSSION

Even though doing regular physical activity benefits older adults in various ways, many seniors who have difficulties with cleaning, shopping, walking, bathing, dressing and other daily activities do not engage in physical activity (Yan et al, 2009). Many older adults who need help with activities of daily living live alone in the community and receive home care. HCAs routinely visit their senior clients to provide housekeeping and personal care and have a chance to promote physical activity for their clients. However, few existing physical activity programs are suitable for HCAs to deliver to their older clients. The aim of the study was to assess the feasibility of implementing the Healthy Moves program which is a simple, safe, chair based evidence-based movements using an affordable and sustainable home care-aide based delivery model that reaches the number of frail older adults living in the community.

The study results indicate that, with support from HCAs, the Healthy Moves for Aging Well program could safely and successfully be disseminated to frail older adults. Overall, the seniors, HCAs and agency staff had a positive perception and high satisfaction with the Healthy Moves program. All of the seniors reported high satisfaction with the new activities and that they would recommend the program to others. Additionally, seniors and HCAs reported that they enjoyed working with each other on the program and both site directors reported that dissemination of the program in the State of Illinois employing HCAs was feasible and acceptable.

We found no serious adverse events and the dissemination strategy of integrating Healthy Moves for Aging Well within "homecare aide" delivery model was feasible. The homecare aide training successfully prepared HCAs to teach the Healthy Moves to frail older persons in the communities. Site directors, HCAs, and older adult participants positively rated Healthy Moves program after 4 months of implementation. These results provide support for the adoption and implementation elements of the RE-AIM model (Glasgow et al., 1999).

Yan et al. (2009) showed that the healthy moves program effectively reduced number of falls, fear of falling, and depression, and pain among functionally impaired nursing home certifiable older adults. In our study, only the participants' scores on the arm curls which measured upper body strength and endurance scale showed significant improvement from before the program to after it. Most measures showed stability and/or slight improvement over the 4-month period. Given the level of frailty of the population, stability might be considered a meaningful outcome. The results are consistent with previously reported benefits of physical activity in frail populations (Braith and Stewart, 2006; Laaksonen et al., 2005; Lam et al., 2004; Yeom et al., 2011). In Britain, participation in physical activity by older adults leads to an annual health care cost benefit of over £20 per person and benefits might be even greater for at-risk groups such as frail older adults (Hill et al., 2007).

This study improves our understanding of the factors related to the adoption of physically active lifestyles in frail older adults in

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the State of Illinois. Furthermore, the results have direct applicability to designing and implementing future home care programs for older frail sedentary adults. It is important to recognize some limitations in our study. This pilot study used a single study group design. Therefore, the intervention needs further testing using a randomly controlled trial to control for extraneous factors which may have influenced the change in exercise performances. Also, this study was conducted among frail seniors enrolled in the Older Americans Act funded home visit program in the State of Illinois and may not be generalizable to other populations and settings. Lastly, we hoped to obtain male, ethnic and racial diversity but we were not able to obtain them. As a result, the older adult participants and HCAs were primarily female and white. We are not sure how acceptable the Healthy Moves program would be for diverse older seniors including male participants.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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