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For low-income adults who experience trouble with one or more activities of daily living (ADL) or two or more instrumental activities of daily living (IADL), does the Community Aging in Place: Advancing Better Living for Elders (CAPABLE) improve performance of ADLs and IADLs?

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AOTA Critically Appraised Papers Series

Evidence Exchange

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CRITICALLY APPRAISED PAPER (CAP)

Szanton, S. L., Thorpe, R. J., Boyd, C., Tanner, E. K., Leff, B., Agree, E., & Gitlin, L. N. (2011). Community aging in place, advancing better living for elders: A bio-behavioral-environmental intervention to improve function and health-related quality of life in disabled older adults. *Journal of the American Geriatrics Society*, *59*(12), 2314–2320. http://dx.doi.org/10.1111/j.1532-5415.2011.03698.x

CLINICAL BOTTOM LINE:

The growing population of older adults has created a societal shift, with many older adults preferring to stay in their homes for a longer period of time. This trend, known as aging-in-place, may provide greater independence and autonomy to older adults compared with those living in nursing homes. However, physical and cognitive changes associated with age may affect the ability to safely perform activities of daily living (ADL) and instrumental activities of daily living (IADL). This study examined performance in ADLs and IADLs, fall efficacy, and quality of life in 40 low-income, community dwelling adults aged 65 and older. Participants reported difficulty with one or more ADLs or two or more IADLs prior to the start of the intervention. Researchers utilized Community Aging in Place, Advancing Better Living for Elders (CAPABLE), an interdisciplinary program to improve performance in ADLs and IADLs.

Participants in the CAPABLE intervention group received 6 60-minute in-home occupational therapy sessions over a 6-month period. Through interview and observation, the occupational therapist collaborated with CAPABLE participants to identify environmental barriers to ADLs and IADLs, potential fall risks, and identify performance areas that were difficult for participants. Follow-up sessions addressed strategies to improve performance in ADLs and IADLs, such as energy conservation techniques, use of adaptive equipment, and task simplification. CAPABLE participants were educated in balance and fall recovery techniques. A handyman contracted by the study completed home modifications recommended by the OT. The OT provided follow-up education to CAPABLE participants on the proper use of adaptive equipment and durable medical equipment. These participants also were seen for four additional sessions over the same 6-month period by a registered nurse (RN). The RN educated CAPABLE participants on pain, depression and medication management, and communication strategies for primary care physicians. In contrast, the control group engaged in sedentary and reminiscence activities with a research assistant for an equal amount of time during the 6-month study period to control for attention and engagement received by the CAPABLE intervention

group.

Results indicated that participants in the CAPABLE intervention showed significant reduction in ADL and IADL difficulties, as well as significant improvements in fall efficacy and quality of life when compared to the control group. Changes from baseline to follow-up resulted in a moderate to strong effect size in the intervention groups, with 94% of the participants in the CAPABLE group reporting they felt their lives were easier, compared to 53% of the control group having the same sentiment. Strengths of this program include addressing internal and external factors and utilizing multicomponents within the participant's home. The CAPABLE program indicates that addressing multiple components may be an effective tool to increase performance of ADLs and IADLs in community-dwelling older adults. Due to the nature and size of this pilot study, more research is indicated to validate the long-term effects and the individual components of the CAPABLE program.

RESEARCH OBJECTIVE(S)

List study objectives.

Determine the feasibility, acceptability, and effect size for the CAPABLE intervention program in low-income adults aged 65 and older who experienced difficulties with one or more ADLs or two or more IADLs.

DESIGN TYPE AND LEVEL OF EVIDENCE:

Level I: Prospective randomized controlled pilot two-group trial

SAMPLE SELECTION

How were subjects recruited and selected to participate? Please describe.

The study's participants were chosen from the nonprofit and government lists of low-income older adults organizations in Baltimore, Maryland who were anticipating home-based services.

Inclusion Criteria

The study's participants were 65 or older, scored 24 or higher on the Mini-Mental State Examination, were considered to be low income, had the ability to stand with or without assistance, and expressed difficulty in performing one or more ADLs or two or more IADLs.

Exclusion Criteria

Individuals were excluded if they were hospitalized three or more times within the past year; they had received in-home rehabilitation services such as occupational therapy, physical therapy or nursing; they had a terminal diagnosis with less than 1 year to live; they received active cancer treatment; if they had plans of relocating within the next year; or they were not cognitively competent to give informed consent.

SAMPLE CHARACTERISTICS

N= (Number of participants taking part in the study)	40

#/ (%) Male	2 (5%)		#/ (%) Female	38 (95%)

Ethnicity	Predominantly African American

Disease/disability diagnosis	Low-income seniors with difficulty in ADL or IADL performance.

INTERVENTION(S) AND CONTROL GROUPS

Add groups if necessary

Group 1

Brief description of the intervention	In the attention control group, the research assistant engaged the study participants in reminiscence and sedentary activities of their choice, such as scrapbooking or making family cookbooks.
How many participants in the group?	16
Where did the intervention take place?	The attention control group was conducted within each participant's home.
Who delivered?	A trained research assistant
How often?	10 60-minute sessions
For how long?	6 months

Group 2

Brief description of the intervention	The intervention group received the CAPABLE intervention, which involved three disciplines: occupational therapy, nursing, and home repair (handyman). Components of the intervention included assessment, education, and interactive identification of barriers to function. The occupational therapist used the Client-Clinician Assessment Protocol (C-CAP) to identify the performance areas the study participants reported as problematic. The participants and the occupational therapist jointly decided on which environmental modifications to address at each home. The occupational therapist also educated participants on energy conservation,

	task simplification, environment simplification, use of assistive devices, balance techniques, and fall recovery techniques, and coordinated the installation of home modifications with the handyman. After installation of the home modifications, the occupational therapist trained each participant on how to properly use the new home modifications. The RN assessed each participant using the C-CAP RN. The RN focused on educating participants on the relationship among pain, depression, strength, balance, medication management, and communication with a primary care provider and how these areas affected daily function. The RN and study participants identified behavioral goals and worked toward those goals during each session. The RN also provided education on resources to address any future needs the participants might have. The handyman was responsible for coordinating, ordering, and installing the home modifications as recommended by the occupational therapist.
How many participants in the group?	24
Where did the intervention take place?	The intervention was conducted within each participant's home.
Who delivered?	An occupational therapist for six visits, a registered nurse for up to four visits, and one handyman visit.
How often?	10 60-minute sessions
For how long?	6 months

Intervention Biases: *Check yes, no, or NR and explain, if needed.*

Contamination:

YES ☐ NO ☑ NR ☐	*Comment:*

Co-intervention:

YES ☐ NO ☑ NR ☐	*Comment:* Participants were excluded if they were receiving other therapy at the time of intervention.

Timing:

YES ☐ NO ☑ NR ☐	*Comment:*

Site:

YES ☑ NO NR ☐	*Comment:* All 10 sessions were completed in the home of the individual participant. Therefore, there was site variation.

Use of different therapists to provide intervention:

YES ☑ NO ☐ NR ☐	*Comment:* An occupational therapist, a registered nurse, and a handyman administered the interventions for the intervention group.

MEASURES AND OUTCOMES

Complete for each measure relevant to occupational therapy:

Measure 1:

Name/type of measure used:	Reductions in ADL and IADL difficulty
What outcome was measured?	Participants self-reported whether they experienced difficulty performing ADLs and IADLs. The ADLs assessed were bathing, dressing, eating, using the toilet, and transferring in and out of bed. The IADLs assessed were telephone use, shopping, preparing food, light housekeeping, taking medications, and managing finances.
Is the measure reliable?	YES ☑ NO ☐ NR ☐
Is the measure valid?	YES ☑ NO ☐ NR ☐
When is the measure used?	The measure was used to determine the baseline level and reassess ADL and IADL performance at the end of the 6-month program

Measure 2:

Name/type of measure used:	Health-Related Quality of Life
What outcome was measured?	The researchers used the Euroqol (EQ-5D) to measure health-related quality of life in participants. The two components of the EQ-5D are a 5-item multi-attribute utility scale and a single-item visual analog scale. The researchers

	did not report whether the measure was reliable or valid.
Is the measure reliable?	YES ☐ NO ☐ NR ☑
Is the measure valid?	YES ☐ NO ☐ NR ☑
When is the measure used?	The measure was used at baseline level and again at the end of the 6-month program.

Measure 3:

Name/type of measure used:	Falls efficacy
What outcome was measured?	The researchers measured falls efficacy by asking participants to self-rate their confidence levels in performing 10 everyday activities such as getting into and out of a chair. This measure was chosen for its relationship to function; reliability was not reported.
Is the measure reliable?	YES ☐ NO ☐ NR ☑
Is the measure valid?	YES ☐ NO ☐ NR ☑
When is the measure used?	The measure was used at baseline level and again at the end of the 6-month program.

<u>Measurement Biases</u>

Were the evaluators blind to treatment status? *Check yes, no, or NR, and if **no**, explain*.

YES ☑ NO ☐ NR ☐	*Comment:* The researchers used single-blind assessments at baseline and at the end of the 6-month program.

Recall or memory bias. *Check yes, no, or NR, and if **yes,** explain*.

YES ☑ NO ☐ NR ☐	*Comment:* The ADL and IADL assessments and the falls efficacy were self-reported and therefore subject to recall or memory bias.

Others (list and explain):

N/A

RESULTS

List key findings based on study objectives

Include statistical significance where appropriate ($p < 0.05$)

Include effect size if reported

The participants in the CAPABLE intervention experienced a significant reduction in ADL and IADL difficulty (ADL difficulty: 2.1 +/- 1.2 at baseline and 0.7 +/- 0.8 after 24 weeks; IADL difficulty: 2.3 +/- 1.4 at baseline and 1.2 +/-1.3 after 24 weeks) when compared with the control group (ADL difficulty: 2.6 +/- 1.4 at baseline and 2.1 +/- 2.3 after 24 weeks; IADL difficulty: 2.0 +/- 1.1 at baseline and 1.8 +/- 1.9 after 24 weeks). The effect size for reduction in ADL difficulty was 0.63 and the effect size for reduction in IADL difficulty was 0.62. The participants in the CAPABLE program also demonstrated a significant improvement in quality of life (3.8 +/-1.2 at baseline and 2.9 +/- 1.6 after 24 weeks) when compared with the control group (3.8 +/- 1.7 at baseline and 3.8 +/- 2.2 after 24 weeks). The quality of life effect size was 0.89. Finally, the participants in the CAPABLE program demonstrated a significant improvement in falls efficacy (33.8 +/- 15.5 at baseline and 28.8 +/-14.1 after 24 weeks) when compared with the control group (30.7 +/- 17.1 at baseline and 36.1 +/- 27.6 after 24 weeks). The falls efficacy effect size was 0.55.

Was this study adequately powered (large enough to show a difference)? *Check yes, no, or NR, and if **no**, explain*.

YES ☐ NO ☑ NR ☐	*Comment:* Researchers neglected to perform a power analysis, so it is uncertain if the small sample size is adequately powered for this study.

Were appropriate analytic methods used? *Check yes, no, or NR, and if **no**, explain*.

YES ☑ NO ☐ NR ☐	*Comment:*

Were statistics appropriately reported (in written or table format)? *Check yes or no, and if **no**, explain*.

YES ☑ NO ☐	*Comment:*

Was the percent/number of subjects/participants who dropped out of the study reported?

YES ☑
NO ☐

Limitations:

What are the overall study limitations?

This study included multiple components of home repair, nursing, and occupational therapy, so it is difficult to determine the contribution of each individual intervention in the program. Further, participants were selected from a waiting list for services and be different from adults with similar needs who were not on such waiting lists. These differences may have been significant enough to affect the results.

CONCLUSIONS

State the authors' conclusions related to the research objectives.

This study demonstrates the effectiveness of a multicomponent intervention to improve ADL and IADL function in low-income older adults. After receiving up to four nursing visits and six occupational therapy visits as well as home repair, the low-income older adult participants in the CAPABLE program self-reported gains in ADL and IADL performance when compared to low-income older adults who were in the attention-control group. The CAPABLE program was designed to address intrinsic and extrinsic factors regarding ADL and IADL functioning, and the results showed that there were moderate effect sizes for reduction in ADL and IADL difficulty (0.63 and 0.62 respectively). Strengths of this study included use of in-home intervention and random group assignment. Future research is warranted to determine the contribution of each individual intervention as well as whether improved ADL and IADL functioning results in low-income older adults aging longer in their homes versus nursing care or other health care transitions.

This work is based on the evidence-based literature review completed by Noelle Bakken Lauryn Banovitz, OTS, Abigail Lafrenz, OTS, Kitsum Li, OTD, OTR/L. Faculty Advisor, Dominican University of California.