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For community-dwelling older adults with functional limitations, does an occupational therapy home modification intervention program that includes the provision of adaptive equipment and/or architectural renovations to the home help improve occupational performance and satisfaction with the ability to perform everyday activities?

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AOTA Critically Appraised Papers Series

Evidence Exchange

**A product of the American Occupational Therapy Association's Evidence-Based Literature Review Project*

CRITICALLY APPRAISED PAPER (CAP)

FOCUSED QUESTION

For community-dwelling older adults with functional limitations, does an occupational therapy home modification intervention program that includes the provision of adaptive equipment and/or architectural renovations to the home help improve occupational performance and satisfaction with the ability to perform everyday activities?

Stark, S. (2004). Removing environmental barriers in the homes of older adults with disabilities improves occupational performance. *OTJR: Occupation, Participation & Health*, 24(1), 32–39.

CLINICAL BOTTOM LINE:

Assisting older adults to age in place by providing necessary environmental modifications is an important aspect of occupational therapy. This study reveals that environmental modifications aimed at removing environmental barriers within the home can significantly improve one's perception and satisfaction with occupational performance, as measured by the Canadian Occupational Performance Measure (COPM). The home modification strategy followed the ecological approach that focuses on participants' environments and how they affect participants' ability to engage in daily occupations within their home. As the first study of its kind to use a client-centered approach in problem identification and intervention in this practice area, the study demonstrated the possible effectiveness of an individualized approach to home modification. It is important to note that although the study has a high dropout rate, there was only one case of refusal to allow the home modification to be completed. However, the agency was not able to complete home modification for seven participants, contributing to 50% of the dropout rate.

RESEARCH OBJECTIVE(S)

List study objectives.

Determine the effect of an occupational therapy home modification intervention program on occupational performance and self-reported levels of satisfaction of occupational performance.

DESIGN TYPE AND LEVEL OF EVIDENCE:

Pre-experimental, pretest–posttest design
Level III evidence

Limitations (appropriateness of study design):

Was the study design type appropriate for the knowledge level about this topic?

YES <input type="radio"/> NO <input checked="" type="radio"/>	Although the study provided valuable information on the possible benefit of home modification in removing environmental barriers for occupational performance, Level III is a low level of evidence. Because the current literature already supports the notion that home modification improves occupational performance, further research calls for higher levels of evidence on this topic.
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SAMPLE SELECTION

How were subjects selected to participate? Please describe.

Participants were selected by an agency that provides free or low-cost architectural modifications in partnership with an occupational therapist who specialized in home modifications for individuals with disabilities.

Inclusion Criteria

Low-income older adults with disabilities. Participants were included if they reported a problem in one or more areas of the Functional Independence Measure (FIM) motor subscale. Participants must own a home and also must have indicated a need for environmental modifications to support their ability to physically function within their home.

Exclusion Criteria

Cognitive dysfunction as indicated by a score of 25 or less on the cognitive subscale of the FIM.

SAMPLE CHARACTERISTICS

$N = 29$ *The article states 29 participants, however, the gender breakdown amounts to 30.

% Dropouts	44%
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#/ (%) Male	6 (20%)		#/ (%) Female	24 (80%)
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Ethnicity	White: 5 African-American: 22 Asian: 1 Other : 1
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Disease/disability diagnosis	Physical impairments affecting the ability to perform daily activities within the home.
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Check appropriate group:

< 20/study group	20–50/study group	51–100/study group	101–149/study group	150–200/study group
	✓			

INTERVENTION(S) AND CONTROL GROUPS

Group 1

Brief Description	<p>A home modification plan was developed by the occupational therapist to eliminate environmental barriers within the home and to specifically address the occupational performance issues identified by the participant. The range of home modifications included the provision of adaptive equipment, architectural modifications, and major home renovations. Interventions were limited to compensatory strategies, and no remediative interventions were used.</p> <p>Following the baseline assessment and the development of the barrier removal plan, the plan was submitted to the construction team. If participants were able to pay for a portion of the home modification service, they did so. If they were unable to, the modifications were provided at no cost to the client. The occupational therapist supervised the constructional implementation of the plan to ensure correct execution of the barrier removal plan, provided training in the use of the modifications, and provided follow-up visits to the participants after construction was completed.</p>
Setting	Intervention occurred in the home of the participant.
Who Delivered?	One occupational therapist
Frequency?	One-time intervention implementation with follow-up visits scheduled as necessary.
Duration?	The average time between completion of home modifications and a follow-up visit by the occupational therapist was 3–6 months.

Intervention Biases:

Contamination

YES/NO YES NO

Co-intervention

YES/NO	NR. Occurrences of co-interventions were not reported, but there was a possibility that participants receiving home modifications also may have been receiving other interventions.
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Timing

YES/NO YES NO

Site

YES/NO YES NO

Use of different therapists to provide intervention

YES/NO YES NO

MEASURES AND OUTCOMES

Complete for each relevant measure when answering the evidence-based question:

Name of measure, what outcome was measured, whether the measure is reliable and valid (as reported in article—yes/no/NR [not reported]), and how frequently the measure was used.

The interview version of the FIM measured the severity of participants' level of disability and functional outcomes of the rehabilitation. The FIM has a reliability of .96 and also has been validated (NR). It was used as a pretest assessment only.

Name of measure, what outcome was measured, whether the measure is reliable and valid (as reported in article—yes/no/NR [not reported]), and how frequently the measure was used.

The COPM measured participants' perceptions of occupational performance. The author stated that this measurement has high test-retest reliability. Validity of the measurement was NR. It was used as a pretest and posttest assessment.

Name of measure, what outcome was measured, whether the measure is reliable and valid (as reported in article—yes/no/NR [not reported]), and how frequently the measure was used.

Environmental Functional Independence Measure (Enviro-FIM) was used to assess the environmental barriers that interfere with the occupational performance of individuals. It is an average score used to measure the different number of barriers for each participant. The environmental barriers that hinder occupational performance were rated on a 10-point scale. The reliability and validity of the Enviro-FIM score were not reported. It was used only in the pretest assessment.

Name of measure, what outcome was measured, whether the measure is reliable and valid (as reported in article—yes/no/NR [not reported]), and how frequently the measure was used.

The number of barriers as identified by the occupational therapist during the home visit were measured. The occupational therapist completed a room-by-room walkthrough of the home to identify safety hazards where the occupational problems occurred. Reliability and validity of this measurement were not reported, and it was used in posttest only

Measurement Biases

Were the evaluators blind to treatment status?

YES/NO Only one intervention group in the study and blinding was not indicated, because it would not affect the results.

Recall or memory bias.

YES/NO

Others (list and explain):

Identification of the number of barriers in the participants' home by a single occupational therapist may threaten both the reliability and validity of measurements. For example, the knowledge of the occupational therapist may have changed during the study period if she or he

attended additional workshops or training in home modification and risk assessment. The change in knowledge could have threatened both the reliability and validity of the results in both barriers identification and the Enviro-FIM scores.

RESULTS

List results of outcomes relevant to answering the focused question

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

Include effect size if reported

There were a total of 13 dropouts. The agency was not able to perform modifications for 7 individuals, 3 of the participants moved to a different home, 2 participants could not have their homes modified, and 1 participant refused the home modifications. As a result, only 16 received the home modification and follow-up.

Both FIM and Enviro-FIM scores were not remeasured in posttest. The author reported that the Enviro-FIM scores ranged from 1 (totally dependent) to 6.4 (safety risk) within the study group. The average Enviro-FIM score for the final study group was 3.6, which may indicate a lower-functioning group. The author also reported the average number of barriers identified per participant, ranging from 1 to 7, with an average of 4.7. On completion of the study, averages of 2.5 modifications per participant were completed by the agency.

Only COPM was used to identify differences in pretest and posttest measurements. Paired t-test was used for within-subject analysis. For those that completed the recommended home modification, results showed an increase in COPM performance from a score of 3.19 to 7.81 ($t = -8.23$; $p = .0001$) and an increase in the COPM satisfaction from a score of 2.25 to 7.69 ($t = -9.54$; $p = .0001$).

Was this study adequately powered (large enough to show a difference)?

YES NO The sample size is small, and only 16 of the 29 participants were able to complete the home modifications and the follow-up measurements.

Were appropriate analytic methods used?

YES NO

Were statistics appropriately reported (in written or table format)?

YES NO

CONCLUSIONS

Analysis of the results revealed that participants experienced statistically significant increases in COPM scores, indicating improvement in the perception of occupational participation and performance satisfaction after receiving home modifications. Furthermore, results of the study support the hypothesis that occupational performance of older adults with functional limitations may improve after the implementation of an occupational therapy home modification plan that is specifically geared toward the removal of environmental barriers. The study is limited by its

small sample size, high dropout rate, and low level of evidence. The sample also did not accurately represent the population of older adults with disabilities because it consisted mostly of African-American women. For this reason, the results of the study may not be generalizable to other populations. Further research is recommended and should include larger, more diverse sample sizes.

This work is based on the evidence-based literature review completed by Sarah Jane Calub, OTS, Matthew Carlson, OTS, Monica Fernandez, OTS, and Kitsum Li, OTD, OTR/L, Faculty Advisor, Dominican University of California.

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