

Emily Nabors, MSG¹; Jon Pynoos, PhD¹; Mindy Renfro, PT, DPT, PhD²; Susy Stark, PhD³; Sarah Szanton, PhD, ANP, FAAN⁴

1. University of Southern California Leonard Davis School of Gerontology; 2. Touro University Nevada; 3. Washington University School of Medicine, Program in Occupational Therapy; 4. John Hopkins University School of Nursing

INTRODUCTION

The majority of older adults prefer to stay in their homes as they age¹. Home modification (HM) adds supports and removes hazards in the home for safety, independence, and health. Research on the role of HM in health, safety and cost effectiveness spans disciplines, populations, interventions, and outcomes. This poster highlights current research findings and policies demonstrating the effectiveness of HM.

CLINICAL & APPLIED RESEARCH

Mindy Renfo, Touro University Nevada

- Homes in Aging-Friendly communities support access to health care, social engagement, physical activity
- Multifactorial fall prevention interventions with HM decrease fall risk, falls and fall injuries in community-dwelling older adults
- Selection, acquisition of appropriate assistive devices, assistive tech and home tech with physical therapist is critical to success, especially with functional limitations

Home Hazard Removal Plan (HARP), Washington University

- Tailored home hazard removal and self-management for high-fall risk older adults by occupational therapists
- Fall risk was reduced by nearly 40% with an \$111 return on investment in reducing health care costs

CAPABLE Program, Johns Hopkins School of Nursing²

- Person-directed, home-based, for frail older adults
- Registered nurse, occupational therapist & handy person help individual achieve functional goals, make ADLs easier, reduce fall risk
- Decreased home hazards, hospitalizations, nursing home admissions, depression; improved functioning
- Medicare savings of \$10K per participant per year

USC Local, State, Nat'l HM Environmental Scan

- Primary, secondary data collection, analyses of Aging Network HM activity
- Creating best practice criteria for case studies, training

*Cited Literature available next to poster

SELECTED SYSTEMATIC REVIEW FINDINGS

ARTICLES	METHODS	RESULTS AND CONCLUSIONS
A scoping review of home modification interventions, Carnemolla, P & Bridge, C, 2018 ³	<ul style="list-style-type: none"> • Mapped breadth, scale of HM evidence. • Identified gaps, graded research quality, and identified 7 key themes; strongest evidence in relation to falls prevention. 	<ol style="list-style-type: none"> 1. Injury and falls prevention 2. Improved function, self-care or independence 3. Physical health and well-being 4. Caregiving 5. Economic effectiveness 6. Aging Process 7. Social Participation
The potential to reduce falls and avert costs by clinically managing fall risk, Stevens, JA & Lee, R, 2018 ⁴	<ul style="list-style-type: none"> • Peer-review literature review. • Participants: Americans age 65+ living in community. • Interventions: Tai Chi, Otago, med mgmt, expedited first cataract surgery, vit D supplementation, distance lenses for outdoor activities, HMs led by occupational therapist. 	<ul style="list-style-type: none"> • Depending on size of eligible population, a single intervention could prevent 9,563–45,164 medically treated falls and avert \$94–\$442 million in direct medical costs annually. • Interventions with potential to help greatest number of older adults: provided HM delivered by occupational therapist (\$38.2 million).
Systematic review of the physical home environment and the relationship to psychological well-being among community-dwelling older adults, Trecartin, SM & Cummings, SM, 2018 ⁵	<ul style="list-style-type: none"> • Examined relationships between physical home environment, functional impairment, and psychological well-being among older adults living in community settings. • Used Ecological Model of Aging as the guiding framework. 	<ul style="list-style-type: none"> • Knowledge of relationships between these constructs still in early stages. • Associational relationships established, but nature is clouded by inconsistency of measurement across studies. • Objective, subjective features of physical home environment linked to psychological well-being throughout literature. Growing body of evidence demonstrates that personal competence moderates those relationships.
Effect of home modification interventions on the participation of community-dwelling adults with health conditions: A systematic review. Stark, S., et al. 2017 ⁶	<ul style="list-style-type: none"> • Investigated role of HM to improve participation outcomes for community-living adults and older adults. • Majority of studies investigated older adult populations and used occupational therapists as interventionists. 	<ul style="list-style-type: none"> • Strong evidence for HM to improve function for people with various health conditions and for both single and multicomponent interventions with HM to reduce rate and risk of falls among older adults. • Moderate evidence for improved caregiving for people with dementia. Comprehensive, higher intensity interventions demonstrated greater efficacy to improve occupational performance. • Emerging evidence for role of occupational therapy in providing effective HM interventions.
Systematic Review of the Effect of Home Modification and Fall Prevention Programs on Falls and the Performance of Community-Dwelling Older Adults, Chase, CA, et al., 2012 ⁷	<ul style="list-style-type: none"> • Explored impact of fall prevention programs and HMs on falls and performance of community-dwelling older adults. 	<ul style="list-style-type: none"> • Strongest results for multifactorial programs that included home evaluations and HMs, physical activity or exercise, education, vision and medication checks, or assistive technology to prevent falls. • Positive outcomes: decreased rate of functional decline, decrease in fear of falling, and increase in physical factors (e.g., balance and strength). • Moderate evidence for HM programs provided individually.
Environmental interventions to prevent falls in community-dwelling older people: a meta-analysis of randomized trials, Clemson, L, Stark, S. et al., 2008 ⁸	<ul style="list-style-type: none"> • A systematic review and meta-analysis of randomized trials determined the efficacy of environmental interventions in reducing falls in community-dwelling older people. 	<ul style="list-style-type: none"> • Pooled analysis of 6 trials (N = 3,298) demonstrated 21% reduction in falls risk (relative risk [RR] = 0.79; 0.65 to 0.97). • Analysis of a subgroup of studies with participants at high risk of falls (4 trials, n = 570) demonstrated a clinically significant 39% reduction of falls (RR = 0.61; 0.47 to 0.79), an absolute risk difference of 26% for a number needed to treat 4 people. • Home assessment interventions that reduced falls with significant effects were: comprehensive, well-focused, and incorporated an environmental-fit perspective with adequate follow-up. • Highest effects associated with interventions conducted with high-risk groups.

POLICY DEVELOPMENTS

The home environment is increasingly being included in policymakers' efforts around health and aging.

Medicare Advantage allows home modification as a special supplemental benefit for the chronically ill

Senior Home Modification Assistance Act (Sen King) to coordinate and disseminate federal HM programs and resources

Administration for Community Living funds USC Leonard Davis School of Gerontology to increase HM availability and access for older adults and caregivers

HUD Receives \$10 million for Home Modifications

State, Local Tax Credits give incentives for accessibility improvements to new, existing housing



DISCUSSION

There is increasing need for home modification research, programs, and policies to:

- 1) support a growing older adult population aging in place; and
- 2) address challenges facing professionals who serve older adults in increasingly complex home and community-based care systems

Varied components of home modification research pose a challenge to making definitive conclusions on the evidence without taking into account individual study characteristics.

Systematic reviews contribute to the field's understanding of the literature; promising programs and policies provide models that could be replicated and disseminated across the U.S.