Evaluation of an Agency-Based Occupational Therapy Intervention to Facilitate Aging in Place

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Purpose: The United States faces a growing population of older adults and accompanying functional disabilities, coupled with constrained public resources and diminishing informal supports. A variety of interventions that aim to improve client outcomes have been studied, but to date, there is limited translational research that examines the efficacy of moving such interventions from clinical trials to agency settings. Methods: A randomized controlled trial was conducted to evaluate a restorative occupational therapy intervention relative to “usual care” among community-dwelling older adults. The intervention included a detailed assessment from a person–environment perspective and provision of adaptive equipment and home modifications where appropriate. The intervention (n = 31) and control groups (n = 29) were evaluated at 3 months and assessed for changes in functional status, home safety, falls, health-related quality of life (HRQoL; EQ5D), depression, social support, and fear of falling; a 4 subgroup analysis also examined outcomes by waiting list status. An informal economic evaluation compared the intervention to usual care. Results: Findings indicated improvements in home safety (p < .0005, b = −15.87), HRQoL (p = .03, b = 0.08), and fear of falling (p < .05, b = 2.22). Findings did not show improvement in functional status or reduction in actual falls. The intervention resulted in a 39% reduction in recommended hours of personal care, which if implemented, could result in significant cost savings. Implications: The study adds to the growing literature of occupational therapy interventions for older adults, and the findings support the concept that restorative approaches can be successfully implemented in public agencies.

Key Words: In-home intervention, Resource allocation, Randomized controlled trial, Policy solutions, Area agency on aging

Families, caregivers, and public agencies are increasingly confronted with situations in which the demand for assistance from older adults in order to “age in place” runs into conflict with available resources. Older adults face an increased number of chronic health conditions as they age, with accompanying sequelae that include, but are not limited to, functional decline, reduced home safety, and increased fall risk. In contrast to the stated desire of the majority of older adults to remain in their current home (Wahl, Schmitt, Danner, & Coppin, 2010), the loss of functional capacity and risk of adverse outcomes interfere with one’s ability...
to remain safely in the home (Desai, Lentzner, & Weeks, 2001; LaPlante, Kaye, Kang, & Harrington, 2004; Ryburn, Wells, & Foreman, 2009). The risk of falls contributes to increased morbidity and mortality, institutional placement, and additional declines in functional status, with related declines in quality of life (American Geriatrics Society, British Geriatrics Society, & American Academy of Orthopedic Surgeons, 2001; Center for Disease Control and Prevention, 2009; Gill, Williams, & Tinetti, 2000).

The number of individuals in the community over age 65 with three or more activity of daily living (ADL) limitations exceeds 2.6 million, or approximately 6.8% of all older adults (Older Americans 2010, 2010). In future years, these numbers are likely to increase due to the projected growth of this population by 80% between 2010 and 2030 (U.S. Census Bureau, 2008), and the greater levels of disability among the cohort of nonelders approaching retirement (Lakdawalla, Bhattacharya, & Goldman, 2004). An anticipated decline in both informal assistance and publicly available supports will compound the problem. The number of available informal caregivers, who provide 80% of all assistance (Straker, Nelson, & Carr, 2005), is projected to decline due to factors including reduced family size, an increase in divorce, and the increase of women in the workforce who historically provided the vast majority of informal care. At the same time, all levels of government face enormous looming budget shortfalls that will result in fewer dollars available per individual in need. This gap between the desire to “age in place” and the ability to do so independently presents families and public agencies with difficult personal and policy choices.

One option is to bridge the gap with supplemental and supportive services, which are costly in time and money. A second option is to allow the functional gap to increase, resulting in increased risk of harm and potential institutional placement, which is costly and may lead to declines in quality of life. A third option, which is being explored in the literature, is providing individuals and families with the tools and skills to bridge the functional gap on their own (e.g., Gitlin, Hauck, Dennis, & Schulz, 2006).

The focus of this approach to home care is on restoring independence and safety through the use of adaptive equipment and home modifications (Ryburn et al., 2009). Over the past decade, a large volume of research has analyzed a variety of occupational therapy and other interventions aimed at reducing falls (e.g., Campbell et al., 2005; Cumming et al., 1999; Nikolaus, & Bach, 2003) and improving functional independence (Clark et al., 1997; Fange & Iwarsson, 2005; Mann, Ottenbacher, Fraas, Tomita, & Granger, 1999; Pardessus et al., 2002; Petersson, Lilja, Hammel, & Kottorp, 2008) through interventions that reduce home hazards, provide assistive devices, and provide education in adaptive strategies.

The results of these types of restorative interventions conflict at times and comparisons are difficult due to differences in the interventions. However, the research increasingly shows promise in terms of both efficacy and efficiency of such intervention approaches. Studies indicate that individuals with disabilities who use adaptive equipment report fewer hours of personal assistance and less unmet need than those who rely solely on personal assistance (Agree, & Freedman, 2003; Hoenig, Taylor, & Sloan, 2003). Additionally, Gitlin and colleagues found strong support for an in-home occupational therapy and physical therapy intervention with functionally vulnerable older adults. Study results revealed reduced difficulties with ADL and instrumental activities of daily living, fear of falling, and other positive outcomes, including reduced mortality (Gitlin, Hauck, et al., 2006; Gitlin, Winter, et al., 2006; Gitlin, Winter, Dennis, & Hauck, 2008).

The purpose of this exploratory study was to evaluate the implementation of an approach similar in concept to that demonstrated by Gitlin and colleagues, but in the context of an Area Agency on Aging (AAA). Given the significant challenges of implementing interventions from controlled studies, translational research that examines interventions in context is of critical importance and was the driving force in this study design. We captured additional data during the course of the study to examine the economic impact of the intervention relative to traditional home care interventions provided by the agencies.

The study was grounded in a person–environment–occupation perspective (Law et al., 1996). Specific hypotheses examined were whether the intervention (a) increased functional independence, (b) increased home safety, (c) improved self-reported quality of life, and (d) reduced subjective fear of falling. The exploratory study also examined the feasibility of implementing an occupational therapy intervention in a public agency and attempted to make preliminary estimates of potential cost savings that might arise from the intervention.
From a translation perspective, we note that the interventions in the Gitlin and colleagues project were implemented outside the structure of the “usual care” environment of a social service agency. The design and implementation of most trials have been completed by investigators affiliated with academic institutions who are not involved in the day-to-day operation of a public social services agency. In addition, the array of services provided in this study were similar to the services available through many AAAs, thus allowing for close comparisons to the status quo.

The Intervention

Over the last decade, the Howard County, MD, Office on Aging has developed a novel, county-funded, community-based occupational therapy service known as Aging in Place. The program, which is similar to the interventions tested by Gitlin, Hauck, and colleagues (2006), uses occupational therapists trained in community-based, comprehensive geriatric assessment, customized in-home modifications, and knowledge and skills for navigating the challenges of community-based practice and working as a member of a community-based team. The intervention includes an in-home assessment of his or her daily activities in the context of the environment, client–family collaboration to achieve mutual goals, provision and training in the use of assistive devices, design and implementation of home modifications, removal of environmental hazards, training in medication management, and education in adaptive and compensatory strategies to improve safety and independence. Setting mutual goals involves consideration of the client’s stated goals while addressing family and therapist concerns about health and safety. For example, an older adult who currently requires the presence of an aide desires to shower independently, but the family has concerns about his or her ability to do so safely. The provision of a tub transfer bench and handheld shower may meet both the client’s goal of independence and the family’s goal of ensuring safety. In general, the goal of the intervention is to balance both safety and independence during daily activities. Interventions are completed in an average of four visits; total visit time averages 9 hours including travel time. Additional details about the study procedures and results are included in the primary author’s dissertation (Sheffield, 2011).

All therapists were experienced, masters level practitioners licensed as occupational therapists who were employees of the Howard County, MD, Aging in Place program. All therapists received a comprehensive community-based training and orientation that included both review of videotapes of prior assessments and interventions, as well as supervised joint home visits with the therapist who developed the program. The training included a 2-day (16-hr) training curriculum, which was supplemented by one-on-one mentorship and joint client visits with the lead occupational therapist, until the therapists achieved subjectively appraised mastery in the model. Throughout the study period, the lead therapist provided all therapists with ongoing support and supervision. We equipped occupational therapists with items and tools frequently used for interventions in the home environment and provided education on the intricacies of various adaptive equipment and home modifications to highlight the strengths and limitations of a wide variety of in-home solutions to typical problems faced by at-risk older adults. The protocol utilized standardized documentation, periodic joint visits, and supervision meetings to increase consistency across therapists and ensure quality.

Methods

Study Design

We obtained approval from the Institutional Review Board of University of Maryland, Baltimore County (UMBC) to conduct a randomized controlled trial design in Howard and Montgomery Counties in Maryland. The trial involved an intervention group that received immediate intervention following evaluation and a delayed intervention control group. The use of a delayed intervention control group (i.e., received initial assessment but no intervention for 3 months) responded to agency concerns about the ethics of longer treatment delays. Because the individuals were already being served by the AAAs and were highly vulnerable, we did not view it as ethically responsible to further delay treatment past the 3 month mark due to concerns about serious or irreversible harm (Fregni et al., 2010). We removed individuals assigned to the control group who were in immediate need of services due to ethical considerations.

Sample

We recruited participants from a pool of individuals aged 65 and older who were currently receiving some form of agency service. All participants were
known to the two local public agencies involved in the study and were community-dwelling seniors who had significant impairments in ADL. We acquired individual names, contact information, and ages from agency administrative databases. Because agency personnel provided the intervention, there were no obstacles (e.g., Health Insurance Portability and Accountability Act) to obtaining client information. Additional inclusion criteria included the ability to speak English, adequate mobility within the home, and sufficient cognitive capacity to participate in the intervention. Case managers assisted in initial screening of clients and therapists made independent determinations upon initial assessment. Study personnel informed all participants about the nature of their participation prior to any assessment and gave participants the option to not participate or to terminate involvement in the study without losing services. Following consent to participate, a research assistant, who was not involved in data collection or analysis, randomized participants to immediate intervention or the delayed intervention control group using a Microsoft Excel random number generator.

In Howard County, individuals fell into two categories: those who were currently receiving services and those awaiting services (i.e., receiving case management only). In Montgomery County, all participants were currently receiving services. Therefore, the sample consisted of four subgroups: waiting list and intervention, waiting list and no intervention, usual care and intervention, and usual care and no intervention. After being randomized to either the intervention or control group, the individual was allocated to the appropriate subgroup based on whether he or she was on the waiting list for services or was already receiving agency services. Usual care for individuals awaiting services involved periodic contacts by a case manager, whereas usual care for individuals receiving services involved any or all of a menu of services including in-home aide services, emergency response units, and medical supplies, in addition to the periodic contact by case managers.

**Procedures**

Occupational therapists conducted a comprehensive baseline assessment with each participant; this included demographic characteristics, health characteristics, and all outcome measures. Following the assessment, the occupational therapist provided immediate intervention to the intervention group and a reassessment 3 months following the intervention. For individuals assigned to the delayed intervention control group, the therapists conducted a reassessment 3 months after the initial assessment, followed by the intervention. Therapists could not be blinded to group assignment because they were both the assessors and the interventionists.

**Outcome Measures**

**Home Safety.**—The Safety Assessment of Function and the Environment for Rehabilitation Health Outcome Measurement and Evaluation (SAFER-HOME; Chiu & Oliver, 2006) is designed to measure changes following occupational therapy home interventions. The tool is comprised of 74 items across 12 categories. Each item reflects a problem area and is scored as follows: no problem, mild, moderate, or severe. Point values are assigned as follows: 1 for mild, 2 for moderate, and 3 for severe problems. Points for each category are summed and then total points are calculated.

**Functional Independence.**—The Functional Independence Measure (FIM) is a measure of functional status that measures seven levels of independence/dependence and is widely used in many inpatient rehabilitation settings. It has been described as “the most robust global outcome measure of disability” (Mackintosh, 2009, p. 65). The FIM is scored predominantly on observation, as opposed to some other assessments that rely entirely on self-report. Although observation is more labor intensive and time-consuming, performance-based measures (such as the FIM) have been found to be highly reliable (Ferrucci et al., 2004). A limitation was that the FIM has been found to have poor sensitivity in the community setting and may not be sensitive enough to detect changes resulting from the intervention. However, alternative measures of functional status designed for this setting have not yet been developed and competing measures suffer from similar problems (see, e.g., Clark et al., 1997).

**Fear of Falling.**—The Short Falls Efficacy Scale-International (FES-I; Kempen et al., 2008) was used to assess fear of falling, which has been found to be an important predictor of falls among older adults.

**Health-Related Quality of Life (HRQoL).**—EuroQol (EQ5D; Barton et al., 2007) measured HRQoL through a health status index value. The
EQ5D captures the client domains of mobility, self-care, performance of usual activities, pain/discomfort, and anxiety/depression. Raw data, which is gathered in the format of a 3-point Likert-type scale, was transformed into a utility index ranging from 0 to 1, with 1 being optimal health, using a weighting algorithm provided by the EuroQol Group for studies conducted in the United States.

Analytic Strategy

As described earlier, individuals belonged to one of four subgroups. For the purposes of the primary analysis, we grouped the two intervention subgroups together and the two control subgroups together. However, we also conducted a four-group analysis (using subgroups of usual care and of wait-list only within each of the two study groups, control and intervention). We compared baseline demographic and health status characteristics of the intervention and control group, as well as drop outs, using chi-square, Wilcoxon rank-sum, and t tests.

We used ordinary least squares (OLS) to compare the intervention and control groups on outcome measures between baseline and follow-up. We selected the covariates, baseline cognition score, and education, based on a review of the literature and their variability within the sample. The literature supports the relationship between functional decline and cognition and the relationship between the groups approached significance. Cognition was operationalized as highest grade achieved.

We added interaction terms when indicated by regression diagnostics and for the purposes of the four subgroup analyses. When we could not verify model assumptions using regression diagnostics, we used robust standard errors and weighted least squares as alternatives to the standard OLS model. For the falls outcome, we developed probit models (presence or absence of any falls) and zero-inflated Poisson models. We utilized Intercooled Stata (Stata I/C) version 10 for all statistical analysis.

Results

The flow of participants through the trial is documented in Figure 1. We recruited a total of 90 participants to take part in the study (46 in the intervention group and 44 in the control group). A total of 30 individuals, 15 from each group, were eventually lost to attrition for various reasons. Reasons for loss of intervention participants included the following: refused to participate (n = 5), ineligible due to age (n = 7), died (n = 1), and unknown (n = 2). Reasons for loss of control group participants included need for immediate intervention (n = 5), ineligible due to age (n = 7), institutionalization (n = 2), and moved out of jurisdiction (n = 1). The final sample size was 60 (31 in the intervention group and 29 in the control group). We found no significant differences on demographic or health-related variables between dropouts and individuals who remained in the study. However, we found significant differences between dropouts and those in the final sample on the FIM (−22.4 points), indicating that individuals who dropped out of the study had poorer functional status than individuals who remained in the study (results not shown).

Descriptive Statistics

Descriptive statistics of demographic variables are displayed in Table 1. On average, participants were aged 81.67±9.46 years. Most were women (80%), White (58%), non-Hispanic (93%), unmarried (82%), and low income (82% reported incomes under $20,000). Twenty-five percent of participants had less than a high school education, 24% were high school graduates, 34% had more than high school (some college or post–high school training), and 17% were college graduates. On average, participants were taking 7 (±4.47) prescription medications; with regard to health status, 31% rated their health as good, 37% as fair, and 27% as poor. The median score on a visual acuity scale was 53/20. The median number of weekly hours of assistance, including both paid and unpaid care, was 5.

There were no significant differences between the final intervention and control groups at baseline with respect to age, gender, race, ethnicity, marital status, education, income, number of medications, self-rated health status, cognitive status, visual acuity, and hours of weekly assistance (see Table 1). Likewise, we detected no significant differences at baseline between groups on any outcome measures (see Table 2 for descriptive statistics and significance tests).

Primary Analysis

Table 3 details the results of the regression analyses for each of the outcome variables.
SAFER-HOME. — The largest effect occurred on the SAFER-HOME, in which the coefficient of treatment was \(-15.87\), indicating substantial reductions in home hazards following the intervention. An interaction effect between baseline score and the assignment variable was significant \((p < .0005)\). The marginal effect of treatment was \(-15.21\) at the average baseline score of 17.24. Results indicated that
individuals whose pretest SAFER-HOME scores were higher (i.e., had more home hazards) gained more from the intervention than those whose scores were lower. We used regression diagnostics to test model assumptions; when we detected results that were not consistent with model assumptions, we made adjustments using robust standard errors and weighted least squares.
No statistically significant differences were found on the FIM.

The coefficient of treatment on the FES was $-2.22$, meaning that individuals in the intervention group reported less fear of falling at follow-up relative to the control group.

On the EQ5D, the coefficient of treatment was $0.08$, representing an $8\%$ improvement in HRQoL relative to the control group.

We tested model assumptions and the stability of coefficients using regression diagnostics. We examined general and specific measures of leverage, residuals, and influence to rule out problems related to influential observations and outliers. We did not find assumptions related to normalcy and multicollinearity to be problematic.

We did observe heteroskedasticity in some models, and we therefore used heteroskedasticity-robust standard errors and an alternative specification of weighted least squares using the log of the residual squared as the weight. Our results were robust to these adjustments.

As described earlier, individuals in the sample fell into four distinct categories. In the secondary analysis, we considered two extensions of the primary models. First, we used a waiting list dummy variable, and an interaction dummy between the waiting list dummy and the intervention group dummy. Second, we allowed for separate intercepts and coefficients for the waiting list subgroups versus the usual care subgroups. We did not detect a differential intervention effect by waiting list status, and we did not reject the null hypothesis on the $F$ test that compared the constrained model to the unconstrained model. We therefore concluded that the results could be pooled; this provided support for the use of the groupings as in the primary analysis. We believe that the results of the main analysis are more relevant given the small sample size of the four subgroups.

### Economic Evaluation Data

Prior to the occupational therapy intervention, the average care plan (inclusive of case management costs) was $10,230 per client. Intervention costs for equipment and home modifications averaged $205 per client. Frequently provided adaptive equipment included handheld showers and suction cup holders, reachers, tub transfer benches, raised toilet seats, grab bars, bed rails, and night lights.
Using the Medicare reimbursement schedule for therapy services ($25/15-min unit; Gitlin, Hauck, et al., 2006), the therapy costs per client were $940 (inclusive of travel time). Thus, the mean intervention cost was $1,145 per client. The comparative cost of the intervention implemented by Gitlin, Winter, and colleagues (2006) was $1,222.

After the OT intervention, the occupational therapists used their professional judgment to assess each participant’s need for continued assistance. They recommended a reduction of 2.36 hr per week per client (0.44 SD), or a 39% reduction relative to the existing care plan created by the social worker/case manager. If these recommendations were to be implemented, there would be significant savings potential relative to the status quo.

**Discussion**

This pilot study aimed to determine whether an agency-based, in-home occupational therapy intervention for at-risk older adults would improve a range of outcomes including home safety, improved functional status, HRQoL, and fear of falling for older adults residing in the community that have significant ADL impairments. Findings supported improvements in home safety, HRQoL, and fear of falling.

With respect to home safety, the magnitude of the improvement (i.e., 1.44 SD) was very large and was consistent with the premise of the intervention, much of which is focused on emergency response, removal of hazards, provision and training of assistive devices, and addressing safety in daily activities. The results on this measure cannot be compared with those in the literature because of its limited use and manner of reporting.

Fear of falling has been found to be an important predictor of falls and perpetuates the cycle of activity avoidance that further predicts additional falls (Pighills, Torgerson, Sheldon, Drummond, & Bland, 2011). The effect size was 0.31 standard deviations, representing a small effect, which is typical of this form of intervention. Although Gitlin, Winter, and colleagues (2006) utilized a somewhat different measure, the percent change that they report between groups at follow-up appears to be similar in magnitude to those detected in this study.

The study found improvements in HRQoL (as measured by the EQ5D) following the intervention; the effect size was 0.35, which is considered a small effect. Given that HRQoL is a broad construct and many factors, including chronic disease, influence its measurement, even this small effect was somewhat unexpected. The existing literature on HRQoL is somewhat conflicting, with some studies finding support for an intervention effect on quality of life, whereas others find no such effect (Pighills et al., 2011; Ryburn et al., 2009; Stolberg, Norman, & Trop, 2004; Steultjens et al., 2004). The fact that the FIM, which measures functional status, and the EQ5D, which measures perceived HRQoL (including items related to functional status) produced different outcomes (i.e., FIM nonsignificant, EQ5D significant) may suggest that an OT intervention has differential influence on client outcomes, which warrants further investigation in future studies.

The results did not support improvements in functional status, as measured by the FIM. As discussed previously, the ceiling effects documented in the community setting make it difficult to measure change, thus the tool was of limited utility in this sample. One example of the limitations of the FIM relates to bathing, an area frequently targeted by such interventions. An individual performing this activity by him or herself, but using extra time and in a manner that poses a risk of injury, would score a 6 (modified independent) on the bathing portion of the FIM. Meanwhile, if the same individual receives a tub transfer bench that allows him or her to transfer safely and independently, the score would still be a 6, since equipment is needed. In such a situation, even though the desired outcome has been realized, the tool has failed to capture the change. The null result is similar to other trials that were unable to detect an intervention effect on functional status (de Craen, Gussekloo, Blauw, Willems, & Westendorp, 2006; Fange & Iwarsson, 2005; Liddle et al., 1996). Gitlin and colleagues’ work utilized a different outcome measure that focused on self-rated difficulty rather than performance, which may explain the difference in results. A critical area for future work is the development of functional status indices with adequate sensitivity for community use.

**Limitations**

There are several limitations of the study. First, our inability to detect expected outcomes may be due to the limited sample size. We lacked adequate power and available degrees of freedom to estimate more complex models that allowed for subgroup analyses and multiple interaction terms. Second,
the actual intervention was provided by several occupational therapists and was customized for each client. Although the therapists were trained and experienced, the nature of the study (which is typical of any translational implementation of an intervention) precluded the ability to have a tightly controlled intervention. Although we allowed for clustering of errors, it was not possible to use fixed or random effects models that may have provided more precise estimates of whether the treatment effect varied by therapist due to our sample size. Third, the therapists were not blind raters, and this could have influenced their ratings. However, the documented interaction effect was unlikely to have emerged by design (i.e., intentionally “uprating” those individuals who started with poorer scores but not those who started with better scores, or those in the control group). A related limitation is that therapists knew that the recommendations were one of the study outcomes. However, they had no vested interest in reducing the number of recommended hours of weekly assistance. Fourth, the short follow-up period may have impaired the ability to detect some outcomes. Fifth, although participants in the study were residents of two different counties, the occupational therapists were direct employees of only one agency. Sixth, the economic evaluation is based upon the assumption that had the reduced hours been implemented, the client would have suffered no adverse outcomes from any such reductions due to the mitigating influence of the assistive devices and home modifications. Sixth, because occupational therapists were not blinded to group assignment, potential concerns of bias on the part of the therapists exist with respect to the scoring of assessments. There are several counterarguments to this concern. The most prominent is that occupational therapists are bound by state licensure; engaging in fraudulent or inaccurate documentation would place their licenses at risk if an adverse event were to occur. Further, they are accustomed to completing these assessments for all clients who are not part of the study. An additional concern resulting from the lack of blinding was that the occupational therapists’ recommendations for the adjusted services would be influenced by their knowledge that this was one of the study objectives. However, if an adverse event were to result from a therapist’s recommendations, he or she would face the possibility of malpractice accusations. This possibility would arguably provide sufficient motivation for accurate assessments. Furthermore, the therapists had no vested interest in reducing the number of hours of weekly assistance.

Policy Implications

This pilot study, which examined a restorative intervention similar in concept and cost to research conducted by Gitlin, Winter, and colleagues (2006), produced results highly relevant to public agencies confronted with increasing need and decreasing resources. The intervention, led to recommendations of 39% fewer weekly personal care services. If this finding were to hold true for larger scale applications of the intervention, and if recommendations were fully implemented, cost savings produced could be used to meet the needs of the growing population of older adults with functional limitations. Anecdotally, the occupational therapists observed that individuals expressed the belief that they were more capable of providing for themselves with less external assistance.

The other important findings relate to the translational nature of the study. As noted, the intervention evaluated in this study was similar in concept, professional skills, equipment, and cost to that of Gitlin, Winter, and colleagues (2006). However, challenges were encountered in the design and implementation of the study that are relevant to other translational efforts. Relevant challenges encountered included (a) suggested interventions proposed by the occupational therapists were at times not implemented by the case managers, and (b) interventions that require professional skills (e.g., occupational therapy assessments and interventions) that are not possessed by existing staff present public agencies with a difficult personnel challenge. In the development of an interdisciplinary intervention, the roles and responsibilities of each professional group need to be defined and understood.

Although this intervention appears to have the potential to confer significant benefits if expanded, unique training is required to develop and implement this intervention protocol. Public agencies have existing work forces that have legal and institutional protections that impede or preclude the capacity of the organizations to radically or rapidly change staffing profiles. Potential new interventions that require professional skills (e.g., occupational therapy assessments and interventions) that existing staff do not possess present public agencies with a difficult personnel challenge.
To enable the national dissemination of this program, extensive training in a restorative community-based approach would be necessary. Further efforts to develop and refine a training curriculum, potentially around using an online modality, could have significant long-term benefits.

Future Research Agenda

One of the main challenges to successful documentation of improvements resulting from home interventions for older adults is the lack of sensitivity in functional assessments. Therefore, the development and testing of a functional status measure intended for community-dwelling older adults is a critical step in advancing research in the home environment. Specifically, the measure would examine the self-perceived difficulty of the task, subjective and objective safety during the task, and observed length for task completion. The measure would most heavily weight those areas that are critical to allow older adults to remain safely in the home.

Some of the limitations in this study, particularly those relating from sample size, could be mitigated through replication using larger sample sizes. For example, more complex models using multiple interaction terms, detailed subgroup analyses, and binary dependent variable models and count models for falls, could be realized using larger and more diverse samples. In addition, longer follow-up periods could answer important questions regarding how long the benefits last and whether periodic follow-up is necessary.

Finally, detailed economic evaluations, comparing costs and benefits of existing interventions (i.e., usual care) versus innovative restorative approaches, would be beneficial in providing support to policymakers in making difficult allocation decisions.

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