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Feasibility of a Novel Intervention to Improve Participation after Stroke

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Abstract

Introduction—Stroke is a leading cause of serious, long-term disability in the US. With shorter inpatient hospital stays, more time in rehabilitation is devoted to medical stabilization and less on skills to regain independence in daily activities. The transition home may be an opportunity for intervention focused on regaining independence. We propose an enhanced rehabilitation transition program called: Community Participation Transition after Stroke (COMPASS).

Method—A prospective, randomized, single-blinded, parallel-group pilot study was completed to demonstrate feasibility with N=15 participants.

Findings—Fidelity to the protocol was achieved: the COMPASS group received 81% of the planned minutes and 83% of the intervention visits. There was no difference between groups for

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healthcare utilization or falls. Adherence was 85% at 3-months and 71% at 9-months for the home modification intervention. At 6-months, the COMPASS group's reintegration to normal living scores improved by 17.39 points for the COMPASS group, and 1.30 for the control group. Environmental barriers decreased in both groups.

Conclusion—This pilot study demonstrated that it is feasible to implement a community participation intervention during the period of transitioning home from inpatient rehabilitation for stroke survivors. Additional studies are necessary to determine the efficacy of the intervention.

Keywords

stroke; home modifications; feasibility; community reintegration; participation

Introduction

Stroke is a leading cause of adult disability in the United States (Doyle, 2002), making the survivors the largest consumer group of rehabilitation services (Williams, 2001). The majority of stroke survivors live with a disability (Patel et al., 2006), report a decreased quality of life (Patel et al., 2006), and have reduced community participation (Desrosiers et al., 2006). The rapid transfer of people with stroke from acute care to inpatient rehabilitation facilities and a reduction in the length of stay in inpatient rehabilitation facilities has resulted in more rehabilitation time devoted to medical stabilization and less on skills to regain independence (Langhorne et al., 2009). A trial of a transitional program focused on environmental modification and participation may fill a serious gap in treatment: participation restriction and activity limitation are not the focus of inpatient rehabilitation.

Therapy completed during inpatient rehabilitation, including occupational therapy (OT), does not typically address the idiosyncratic environmental barriers stroke survivors face when they return to the community (Richards et al., 2005). Additionally, in a review of inpatient rehabilitation, few OT sessions addressed community integration (Latham et al., 2006). Only rarely did OTs visit the home to address the environmental barriers people with stroke encounter (Latham et al., 2006). As a result, patients and their families leave inpatient rehabilitation without the necessary skills to successfully return home and reintegrate back into the community. Furthermore, skills learned in an idealized clinical setting often cannot be generalized to the home (French et al., 2008). Addressing the transition between inpatient rehabilitation and the home may be a low cost and feasible intervention to improve independence and quality of life for people with stroke.

Community Participation Transition after Stroke (COMPASS) is a compensatory intervention consisting of one pre-discharge and five post-discharge home visits by an OT to supplement inpatient rehabilitation. This tailored intervention, delivered in the home during the transition from inpatient rehabilitation to home, resolves barriers to independence in the community by using home modifications (e.g., grab rails by the toilet) supported by strategy training (enabling participants to remove environmental barriers in the home and community). This program is designed use interventions that have been successful with other populations and settings to augment current rehabilitation practice for patients transitioning from inpatient rehabilitation to home.

To address the current gap in services between inpatient rehabilitation and home, we conducted a study with a population of adults undergoing inpatient rehabilitation for ischemic stroke at the point of transition to the community. The aim of this study was to examine the feasibility, safety, and preliminary efficacy of a transition program designed to increase the independence of people with stroke in the community. We tested the hypothesis that COMPASS will be acceptable, feasible, and that measures of community participation and daily activity performance would demonstrate improvements at 6 months post stroke.

Literature Review

Environmental modifications have demonstrated efficacy in improving home function and safety for adults living with a disability, however the impact of home modification interventions for stroke survivors is unknown. Environmental interventions are most effective if they are delivered by OTs, include a comprehensive assessment, and include the provision of the environmental changes (Clemson et al., 2008). Emerging evidence also points to the importance of tailoring and using a client-centered approach (Clemson et al., 2008) to improve home modification intervention outcomes. In a recent systematic review, environmental modification demonstrated strong efficacy for improving daily activity performance and reducing falls among adults and older adults with disabling conditions (Stark et al., 2017). No studies were identified addressing the efficacy of home modifications for stroke, despite face validity that environmental interventions might be an effective approach to reduce excess disability for this population.

A paucity of evidence also exists for interventions targeting the transition period from inpatient rehabilitation to home, however community-based occupational therapy and early supported discharge services have demonstrated positive outcomes for stroke survivors. Overall, occupational therapy provided to stroke survivors living in the community improves participation in targeted areas, such as activities of daily living and instrumental activities of daily living (Walker et al., 2004; Legg et al., 2007). For stroke survivors discharging from the hospital setting directly home, early supported discharge services provide multidisciplinary community-based rehabilitation immediately following hospital discharge and may include a home assessment prior to discharge (Rodgers and Price, 2017). Early supported discharge services demonstrate improved function for stroke survivors with multidisciplinary team input to home-based rehabilitation (Langhorne et al., 2005; Walker et al., 2004; Langhorne and Baylan, 2017). Those transitioning home from inpatient rehabilitation may similarly benefit from implementation of community-based OT programs designed to support discharge and facilitate resumption of activities. In order to address the gap in evidence for transition services for individuals discharging from inpatient rehabilitation to home, the COMPASS intervention uses unique combination of evidence-based principles of effective home modification interventions, targeted community-based occupational therapy, and supportive discharge services to improve participation outcomes at home and in the community.

Evidence of interventions to address the chronic needs of stroke survivors as they transfer from a medical to a community model of care is lacking and has been identified as a high priority for stroke research (Winstein et al., 2016). Two areas addressed by COMPASS,

environmental barriers and self-management strategies, have been identified as priority areas for rehabilitation research. Transition interventions, including environmental modifications (provision of adaptive equipment) and problem-solving approaches similar to those proposed in COMPASS are rated as having high face validity and low risk, but lack rigorous evidence of efficacy (Winstein et al., 2016). The NIH Plan for Rehabilitation Research (Eunice Kennedy Shriver National Institute of Child Health and Human Development and the NIH, 2016) has prioritized research that provides an understanding of environmental barriers and individual participation outcomes in real-world settings. In addition, the plan specifically calls for research using self-management strategies that can be implemented in community settings to achieve patient independence and improve caregiver outcomes. This study will provide preliminary evidence for the feasibility of a community-based environmental modification intervention using self-management strategies to improve participation outcomes for individuals transitioning from inpatient rehabilitation post stroke.

Method

To demonstrate proof of feasibility for COMPASS during transition to home among patients with ischemic stroke, we conducted a prospective, randomized, single-blinded, parallel-group pilot. All participants received usual care plus an in-home evaluation prior to discharge and five 90-minute visits in the home after discharge. Participants randomized to COMPASS received the home modification and community participation intervention. The attentional control group received an evidence-based stroke education program based on evidence-based guidelines and literature review (Ostwald et al., 2008). Both programs were provided by trained occupational therapy practitioners (OT). The OTs were trained in a one day session to provide only one of the programs and completed a visit by visit checklist of the intervention components at each visit. Participants were followed for 12 months. All assessments were conducted by trained raters blinded to group allocation. All study procedures were approved by the institutional review board at Washington University.

Potential participants were recruited through the rehabilitation staff at a 96-bed inpatient rehabilitation hospital serving the St. Louis Metropolitan Area. Following the rehabilitation hospital's policy for recruitment, case managers were asked to present the study to all patients admitted with a stroke diagnosis and plans to return home. The study team approached and assessed eligibility for all patients that gave permission via case managers for contact. For the pilot study, participant criteria was selected based on predictive factors of stroke outcomes (Ween et al., 1996) and requirements for participation in the assessments and intervention to select a target population that was likely to discharge home with a need for home modifications to address functional impairments. The inclusion criteria included: 1) 45 years old; 2) acute ischemic stroke; 3) baseline National Institutes of Health Stroke Scale (NIHSS) ≤ 8 or overall functional independence measure (FIM) score ≥ 90 ; 4) independent in daily activities prior to stroke (pre morbid Rankin score of 2 or less); 5) plan to discharge to home. Exclusion criteria included: 1) severe terminal systemic disease that limits life expectancy to < 6 months; 2) previous disorder (e.g. dementia) that makes interpretation of the self-rated scales difficult or Short-Blessed test score of 10 or less (indicating significant cognitive impairment); 3) moderate to severe Aphasia as determined by the NIHSS Best Language rating of 2 or more due to the communication required to

complete the outcome measures; 4) reside in congregate living facility; or 5) not eligible for a therapeutic pass (required to leave the rehabilitation center). Written informed consent was obtained from all participants. Study data were collected and managed using REDCap (Research Electronic Data Capture) a secure, web-based application designed to support data capture for research studies (Harris et al., 2009). Participants were stratified by age and gender using a 1:1 ratio. In order to facilitate implementation of home modifications prior to discharge, randomization was elicited immediately following the completion of the baseline assessments using a web-based randomization module on REDCap. Participants were naïve to the active treatment condition.

Intervention

COMPASS is a complex intervention that combines a unique set of effective treatment strategies (Clemson et al., 2008; Kreuter and Skinner, 2000; Cummings et al., 2009; Lorig and Holman, 2003) at a new point of care (transition from inpatient rehabilitation). A treatment manual (available by request from the authors) was developed following the model described by Carroll and Nuro (2002) to guide interventionists, including the conceptual framework, standardized assessments, treatment goals, intervention elements, and format of delivery including a visit-by-visit grid outlining key components of each visit. A description of the key components of the intervention as described in manual are the presented in this manuscript. The treatment includes a set of one pre-discharge and five post-discharge home visits by an occupational therapist to remediate barriers in the home and community that influence daily activities and community participation. Participants identify problematic activities in the home and community to be addressed in the intervention. The home modification intervention is a collaboration between the OT and participant, modifications are installed by the OT or licensed contractor, and active practice occurs in the home and community including caregiver training (if appropriate). The treatment theory guiding the intervention is a competence-press model that posits changes to the physical environment (e.g., grab bars near the toilet), matched with the individual's pattern of functional loss, will improve the outcome performance (Lawton, 1973). We consider the essential elements (Whyte and Hart, 2003) of COMPASS to be an environmental modification intervention that includes physical changes to the environment and active practice of daily activities in the participant's own home and community environment.

There are three active ingredients of the intervention. First, the compensatory strategies are tailored (Kreuter and Skinner, 2000) by the interventionist to each individual's pattern of functional loss and unique home and community environments. Tailoring is necessary, given the wide range of variability in home environments and control over environmental changes in one's private home has demonstrated increased adherence and acceptance of treatment. Second, to further improve adherence, motivational enhancement (ME) strategies are used (Cummings et al., 2009). ME is a client-centered, directive method for enhancing motivation to change health behaviors. Third, self-management incorporates the ability to use problem-solving skills to manage a chronic condition, make decisions, identify resources, and partner with care providers (Lorig and Holman, 2003). The self-management techniques are used to give the participants the ability to identify and solve barriers to participation at home and in the community (Kendall et al., 2007). The manual and training provides guidance to the

interventionist in the implementation of COMPASS, using the active ingredients to support the implementation of an effective home modification intervention.

Measurement

Process outcomes such as feasibility, safety, and preliminary efficacy of COMPASS are described as follows. A process evaluation was conducted to evaluate feasibility (Linnan and Steckler, 2002). Feasibility was defined by recruitment, implementation, use, cost, and safety. Reach was defined by percentage of recruitment goals. The effort of recruitment from study staff is evaluated by referrals, recruitment goals achieved by time, and qualitative reports about recruitment issued from the study team from communication log, which the staff fills out all recruitment activities. Implementation was assessed by measuring intervention delivery by minutes and sessions as well as intervention components throughout the 2-month period. Therapists documented these variables by visit-by-visit grid on each visit. Cost was defined as total money spent on the items modification in each participant's home. Adherence rate of COMPASS was calculated as the number of recommendations used per recommendations suggested using the equipment supplied by our study at post-intervention and 9 months. High adherence rate indicates better acceptance to the intervention. No recommendations and equipment were given to the education group, but a quiz was given to participants at the end of intervention to confirm participants absorbed the information in education materials. Safety of the intervention was evaluated by comparing health care utilization and falls between groups. Health care utilization was defined by emergency room visits, hospitalizations, physician visits, and outpatient occupational therapy/physical therapy visits. Total numbers of each type of visit were gathered from participants by phone interviews throughout the 12-month follow-up period. Safety was measured by frequency and severity of falls. A blinded research assistant called participants post intervention at 6, 9, and 12 months to gather fall information. The number of falls, injury, and severity of the injury were assessed during each phone interview. Severe adverse events such as death were also documented.

Preliminary efficacy outcomes are community participation, health-related quality of life, ADL performance and environmental barriers in home. Community participation was measured by Reintegration to Normal Living Index (RNLI) (Wood-Dauphinee et al., 1988), which measures the extent to which a person is able to resume normal life activities after illness or injury. The 11-item questionnaire quantifies participation (basic self-care, functional mobility, avocational and productive pursuits, and travel in the community) with a higher score indicating higher attainment of normal levels of living. Health-related quality of life was measured by the Stroke Impact Scale (SIS) (Duncan et al., 2001). The SIS is a 59-item questionnaire which measures quality of life relates to participation, ADLs, mobility, hand function, strength, memory, communication, and emotion. It has demonstrated high content validity and construct validity. The higher score means less difficulty in experiences of an item. Other than total SIS score, we also used the ADL subscale (10 items) to explore ADL difficulties.

The In-Home Occupational Performance Evaluation (I-HOPE) was used to measure ADL performance and magnitude of environmental barriers in the home. The I-HOPE is a

performance-based, client-centered assessment evaluating the performance of 44 in-home activities. Four subscales measure limitations in daily activities, self-reported performance and satisfaction with performance of problematic activities, and the magnitude of environmental barriers that influence performance. The four subscales have high internal reliability ($\alpha=.77-.78$) and interrater reliability ($\alpha=.94-1.0$) (Stark et al., 2010) and are sensitive to change in environmental support. Total score of performance, satisfaction and environment barriers were evaluated at baseline and end of intervention.

Statistical analysis

Statistical analysis was conducted in SPSS 24.0. Descriptive statistics were used to describe age, gender, race along with other variables indicating participants' status such as inpatient days and function at discharge. Due to small and unequal sample size, Mann-Whitney test was used to determine significant differences between groups. For process outcomes, descriptive statistics were used to present feasibility and safety variables and the Mann-Whitney test was used to compare health utilization and safety between groups at 6 months and 12 months post-intervention. For preliminary efficacy outcome, Wilcoxon signed-rank tests were conducted to detect difference between baseline and post-tests (immediately, 6 months or 12 months post-treatment) within each group.

Results/Findings

Participants (N=15) were on average aged 66 years, 70% male, and 60% African American. Study flow through is demonstrated in Figure 1. There was no significant age difference between groups; the groups were balanced for race and gender. There were six males (66.7%) in COMPASS (n=9), and five males (83.3%) in the education group at baseline. There were four African Americans (44.4%) and five Caucasian in COMPASS, five African American (83.3%) and one Caucasian in the education group. Nevertheless, meaningful differences existed between groups regarding severity of stroke. Total inpatient days for COMPASS was longer than the education group. The COMPASS group also demonstrated lower (worse) baseline scores on the Functional Independence Measure versus the education group (table 1).

Process Outcomes

Feasibility

For reach, 17 participants were enrolled in the 12-month recruitment period; 53% enrolled in the last 3 months. Two participants were unable to complete the home assessment before discharge (due to change in discharge date and home construction) and were excluded from the study. Barriers perceived from the study staff were lack of referral and tight recruitment gap to screen and coordinate home visits before patient discharge with the hospital staff. The goal of fidelity to intervention protocol was achieved. The COMPASS group received 365.0 ± 108.3 (81%) and the education group received 354.8 ± 120.1 (78%) of the planned minutes. Participants in COMPASS and the education groups completed 5.0 ± 1 (83%) and 4.4 ± 1.3 (73%) visits, respectively. Participants in COMPASS completed 100% of visits offered, the education group completed 83% of visits. For the COMPASS group, 94%

(range: 79–100%) of intervention components were delivered over an average of 65.9 ± 24.3 days based on the visit-by-visit grid.

There was no difference among health care utilization at 6 months or 12 months; the COMPASS and education groups reported similar health care utilization rates (table 1). Adherence was 84.9% (SD .06, range 77–100%) at 3-months, 71.25% (SD .31, range 27–100%) at 9-months. The average cost of home modifications was \$495 (range \$119–946), with an average of 10.3 (range 7–13) modifications installed per participant. Modifications were paid through study funds, local organizations, and study participants and targeted areas including the bathroom, getting in/out of the home and car, and moving around the home.

Safety

No injurious falls were experienced in either group (table 1). One participant in COMPASS died due to disease not related to the intervention.

Preliminary efficacy

The trial was not powered to detect a difference between groups; however, clinically meaningful (Mayo et al., 2015) changes were detected in the primary (RNLI) and secondary outcomes (figure 2). At 6 months, COMPASS demonstrated an improvement of 17.4 points in RNLI, whereas score improved in the education group is 1.3. The SIS participation and ADL subscales improved respectively for both groups. Baseline and 6-month, baseline and 12-month scores are reported by group in table 2. Environmental barriers decreased respectively for both groups. Total environment barriers decreased in COMPASS by 65.69, and 40.27 for the education group. The COMPASS group demonstrated a clinically meaningful change on the RNLI of 7% (Mayo et al., 2015). The COMPASS group also demonstrated a clinically meaningful average improvement in daily activity performance on the SIS ADL scale (17.3 points) (Lin et al., 2010). Environmental barriers (I-HOPE) decreased in the expected direction. The more impaired COMPASS group had clinically meaningful changes in activity and participation scores and a decrease in environmental barriers.

Discussion and implications

This pilot study demonstrated that it is feasible to implement a program within the context of in-patient rehabilitation to improve community participation following stroke. Initial outcomes demonstrate that the intervention may improve participation outcomes, warranting additional research to evaluate the efficacy of the program. Participants who received home modifications reported high levels of adherence up to 9-months post-intervention. The results of this study should be interpreted within the context of the small, homogenous sample size.

Similarly to a previous study conducted within the UK healthcare system (Drummond et al., 2013), this study demonstrated that it is feasible to conduct a randomized control trial with pre-discharge home visits within the US healthcare system. Participants were willing to be randomized and it was feasible to work with the inpatient rehabilitation team to complete a home visit. The COMPASS intervention demonstrated high fidelity to the protocol

indicating that it is possible to deliver this complex intervention during the period of transitioning home from inpatient rehabilitation post-stroke. Despite the complexity of the intervention, occupational therapists were able to deliver the intervention according to the manual and visit-by-visit grid, ensuring completion of essential components, while tailoring the intervention to meet the diverse needs of stroke survivors. To ensure that this complex intervention was delivered in a standardized manner across participants, all therapists underwent training to deliver the intervention using a manualized approach and visit-by-visit grid to ensure that essential components were delivered at each treatment session. Using this approach, therapists tailored the intervention components (i.e. individualized home modification recommendations and community goals). With an average cost of \$495 per participant for home modifications, the intervention is relatively low cost. Due to the unique person and environment factors each stroke survivor encounters, it is essential that a standardized, yet tailored intervention is deliverable.

COMPASS also demonstrated feasibility regarding safety. Initial pilot testing established that the intervention is safe; no injurious falls occurred during the follow-up period. COMPASS did not result in additional health care visits compared to the control group, despite that participants in the COMPASS group started with a more severe level of stroke. One participant died due to health conditions not related to our trial. These results indicated COMPASS is safe for implementation.

The pilot study demonstrated that participants are willing to be randomized, the intervention is feasible, and the tailored intervention can be delivered in a standardized manner with high fidelity. Problems emerged with the recruitment rate, unbalanced groups, and treatment dose. Recruitment goals were not achieved. In addition, the treatment group only required 80% of the estimated treatment dose to achieve prescribed intervention elements. Modifications addressing each of the problems will be implemented in future research studies.

The study results demonstrated that the intervention might influence participation outcomes. Both groups demonstrated improvements in function over time. Meaningful differences existed between groups in regards to severity of stroke: total inpatient days averaged 24.1 ± 7.9 for COMPASS and only 16.7 ± 5.4 for Control and the COMPASS group demonstrated lower baseline scores on the FIM in comparison to the control group. The COMPASS group showed meaningful improvement in RNLI, and SIS ADL at six-month. Environmental barriers (I-HOPE) decreased in the expected direction. The control group may have obtained home modifications through other means, which should be evaluated in future trials.

Recruitment was the biggest challenge in this study. The recruitment method was to use case managers at the rehabilitation center to act as a liaison between potential participants and study team members. Over the year recruitment period, only 56 participants were referred. Twenty-five percent of referrals did not have sufficient time between referral and discharge to complete the consent process. Previous studies addressing recruitment for inpatient stroke trials demonstrated recruitment difficulties and that recruitment rates vary widely between sites (Tyson et al., 2015). As experienced in this study, the importance for trial staff to work with and build a relationship with the recruiting clinicians is imperative to recruitment in

inpatient rehabilitation facilities (Tyson et al., 2015). Additional strategies to improve recruitment are monitoring progress of patients ineligible upon admission due to stroke effects; an inclusive approach, where the choice of participation in the study is considered the patients' not the healthcare practitioners; or dedicated trial therapists, or study recruiters and screeners (Tyson et al., 2015).

This pilot study was designed to contribute to the development and design of future trials, therefore the generalizability is limited. The intervention was tested with a small, homogenous group of stroke survivors; it is necessary to conduct trials with larger and more diverse stroke populations to understand the efficacy of the intervention. As participants with hemorrhagic strokes or aphasia were excluded from this study, it is important to determine necessary modifications to the intervention as well as the feasibility and efficacy of the intervention. Future trials should also further evaluate the dose of the intervention. The dose was estimated based on previous trials of home modifications with older adults, however, the group in this study only required only required 80% of the estimated time. Another limitation was that study interventionists were not blind to group allocation. However, inpatient rehab treating therapists and case managers remained blind to group allocation. The use of an attentional-control education group, which provided stroke education is another limitation of the study. The education was designed to address topics that the authors believed would not influence participation outcomes, such as nutrition and other stroke risk factors, but it is possible that the education influenced control group outcomes.

Conclusion

The novel program to improve home and community participation for stroke survivors was acceptable, feasible, and safe for implementation during the transition home from inpatient rehabilitation. This new intervention has the potential to improve the delivery of rehabilitation services, positively affecting functional and participation outcomes for people with stroke.

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References

- Carroll KM, Nuro KF. One size cannot fit all: A stage model for psychotherapy manual development. *Clinical Psychology: Science and Practice*. 2002; 9(4):396–406.
- Clemson L, Mackenzie L, Ballinger C, et al. Environmental interventions to prevent falls in community-dwelling older people a meta-analysis of randomized trials. *Journal of Aging and Health*. 2008; 20(8):954–971. [PubMed: 18815408]
- Cummings SM, Cooper RL, Cassie KM. Motivational interviewing to affect behavioral change in older adults. *Research on Social Work Practice*. 2009; 19(2):195–204.

- Desrosiers J, Noreau L, Rochette A, et al. Predictors of long-term participation after stroke. *Disability & Rehabilitation*. 2006; 28(4):221–230. [PubMed: 16467057]
- Doyle PJ. Measuring health outcomes in stroke survivors. *Archives of physical medicine and rehabilitation*. 2002; 83(12 Suppl 2):S39. [PubMed: 12474170]
- Drummond A, Whitehead P, Fellows K, et al. Occupational therapy predischARGE home visits for patients with a stroke (HOVIS): results of a feasibility randomized controlled trial. *Clinical rehabilitation*. 2013; 27(5):387–397. [PubMed: 23113988]
- Duncan PW, Wallace D, Studenski S, et al. Conceptualization of a new stroke-specific outcome measure: The Stroke Impact Scale. *Topics in Stroke Rehabilitation*. 2001; 8(2):19–33. [PubMed: 14523743]
- Eunice Kennedy Shriver National Institute of Child Health and Human Development and the NIH D. NIH Research Plan on Rehabilitation. Washington, DC: National Institutes of Health; 2016.
- French B, Leathley M, Sutton C, et al. A systematic review of repetitive functional task practice with modelling of resource use, costs and effectiveness. *Health Technology Assessment*. 2008; 12(30):1–117.
- Harris PA, Taylor R, Thielke R, et al. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *Journal of biomedical informatics*. 2009; 42(2):377–381. [PubMed: 18929686]
- Kendall E, Catalano T, Kuipers P, et al. Recovery following stroke: The role of self-management education. *Social Science and Medicine*. 2007; 64(3):735–746. [PubMed: 17079060]
- Kreuter MW, Skinner CS. Tailoring: what's in a name? *Health Education Research*. 2000; 15(1):1–4. [PubMed: 10788196]
- Langhorne P, Baylan S. Early supported discharge services for people with acute stroke. *The Cochrane Library*. 2017
- Langhorne P, Coupar F, Pollock A. Motor recovery after stroke: a systematic review. *The Lancet Neurology*. 2009; 8(8):741–754. [PubMed: 19608100]
- Langhorne P, Taylor G, Murray G, et al. Early supported discharge services for stroke patients: a meta-analysis of individual patients' data. *The Lancet*. 2005; 365(9458):501–506.
- Latham NK, Jette DU, Coster W, et al. Occupational Therapy Activities and Intervention Techniques for Clients With Stroke in Six Rehabilitation Hospitals. *The American Journal of Occupational Therapy*. 2006; 60(4):369–378. [PubMed: 16915866]
- Lawton, MNL. Ecology and the aging process. In: Lawton, CLEMP., editor. *Psychology of adult development and aging*. Washington DC: American Psychological Association; 1973. p. 619-674.
- Legg L, Drummond A, Leonardi-Bee J, et al. Occupational therapy for patients with problems in personal activities of daily living after stroke: systematic review of randomised trials. *Bmj*. 2007; 335(7626):922. [PubMed: 17901469]
- Lin K-C, Fu T, Wu C-Y, et al. Minimal detectable change and clinically important difference of the Stroke Impact Scale in stroke patients. *Neurorehabilitation and neural repair*. 2010; 24(5):486–492. [PubMed: 20053950]
- Linnan, L., Steckler, A. *Process evaluation for public health interventions and research*. Jossey-Bass; San Francisco: 2002.
- Lorig KR, Holman HR. Self-management education: history, definition, outcomes, and mechanisms. *Annals of Behavioral Medicine*. 2003; 26(1):1–7. [PubMed: 12867348]
- Mayo NE, Anderson S, Barclay R, et al. Getting on with the rest of your life following stroke: A randomized trial of a complex intervention aimed at enhancing life participation post stroke. *Clinical rehabilitation*. 2015 0269215514565396.
- Ostwald SK, Davis S, Hersch G, et al. Evidence-based educational guidelines for stroke survivors after discharge home. *The Journal of neuroscience nursing: journal of the American Association of Neuroscience Nurses*. 2008; 40(3):173. [PubMed: 18578276]
- Patel MD, Tilling K, Lawrence E, et al. Relationships between long-term stroke disability, handicap and health-related quality of life. *Age and Ageing*. 2006; 35(3):273–279. [PubMed: 16638767]
- Richards LG, Latham NK, Jette DU, et al. Characterizing occupational therapy practice in stroke rehabilitation. *Archives of physical medicine and rehabilitation*. 2005; 86(12):S51–S60. [PubMed: 16373140]

- Rodgers H, Price C. Stroke unit care, inpatient rehabilitation and early supported discharge. *Clinical Medicine*. 2017; 17(2):173–177. [PubMed: 28365632]
- Stark S, Keglovits M, Arbesman D, et al. Effectiveness of Home Modification Interventions on the Participation of Community-Dwelling Adults and Older Adults: A Systematic Review. *American Journal of Occupational Therapy*. 2017; 71(2):7102290010.
- Stark S, Somerville E, Morris J. In-Home Occupational Performance Evaluation. *American Journal of Occupational Therapy*. 2010; 64
- Tyson SF, Thomas N, Vail A, et al. Recruiting to inpatient-based rehabilitation trials: lessons learned. *Trials*. 2015; 16(75)
- Walker M, Leonardi-Bee J, Bath P, et al. Individual patient data meta-analysis of randomized controlled trials of community occupational therapy for stroke patients. *Stroke*. 2004; 35(9):2226–2232. [PubMed: 15272129]
- Ween JE, Alexander MP, D'esposito M, et al. Factors predictive of stroke outcome in a rehabilitation setting. *Neurology*. 1996; 47(2):388–392. [PubMed: 8757009]
- Whyte J, Hart T. It's More Than a Black Box; It's a Russian Doll: Defining Rehabilitation Treatments. *American Journal of Physical Medicine & Rehabilitation*. 2003; 82(8):639–652. [PubMed: 12872021]
- Williams GR. Incidence and characteristics of total stroke in the United States. *BMC neurology*. 2001; 1(1):2. [PubMed: 11446903]
- Winstein CJ, Stein J, Arena R, et al. Guidelines for Adult Stroke Rehabilitation and Recovery A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. *Stroke*. 2016; 47(6):e98–e169. [PubMed: 27145936]
- Wood-Dauphinee S, Opzoomer M, Williams J, et al. Assessment of global function: The Reintegration to Normal Living Index. *Archives of physical medicine and rehabilitation*. 1988; 69(8):583–590. [PubMed: 3408328]

Key messages

Key findings

Implementing a complex, manualized intervention, including home modifications and self-management, during the transition from inpatient rehabilitation to home for stroke survivors is feasible and can be delivered with fidelity.

What the study has added

This study demonstrates feasibility of a novel transition program for stroke survivors. The program has the potential to improve rehabilitation service delivery, positively influencing participation for people with stroke. The information obtained from this pilot study including recruitment and delivery of a complex, tailored intervention in the community setting provides guidance for the design of future studies.

Figure 1.
Study flow through

Figure 2.
Preliminary Efficacy

Table 1

Feasibility outcome results

Baseline demographics	COMPASS	Education		
Age	66.89 (7.96)	64.67 (8.21)		
Inpatient days	24.10 (7.94)	16.67 (53.5)		
FIM	62.44 (21.81)	76.50 (15.35)		
	6 months	12 months		
Feasibility	COMPASS	Education	COMPASS	Education
ER visit	0.33(0.71)	0.17 (0.41)	0.56(0.88)	0.50(0.55)
Hospitalization	0.22 (0.44)	0.00 (0.00)	0.67(1.12)	0.00(0.00)
Doctor visit	1.56 (1.13)	2.33(2.42)	6.00(3.50)	10.33(10.86)
OT outpatient visit	0.11 (0.33)	0.00(0.00)	19.44(24.14)	36.00(36.30)
PT outpatient visit	0.22 (0.44)	0.00(0.00)	26.11(30.10)	28.67(34.72)
Number of falls	0.78 (1.39)	0.00(0.00)	2.17(2.32)	1.83(1.94)

Note. FIM: functional independence measure.

Table 2

Preliminary efficacy results

		COMPASS	Attention control
RNLI	Baseline	52.73 (18.87)	62.88 (22.24)
	6 mo	67.95 (24.18)	64.18 (32.91)
	12 mo	65.45 (27.17)	81.82 (20.77)
SIS Total	Baseline	38.33 (21.79)	40.83 (22.00)
	6 mo	60.00 (20.00)	52.00 (16.81)
	12 mo	39.00 (28.81)	60.00 (14.14)
SIS ADL	Baseline	37.11 (17.09)	52.83 (15.03)
	6 mo	52.75 (26.18)	58.40 (12.76)
	12 mo	45.20 (28.52)	64.00 (16.00)
I-HOPE			
Performance	Baseline	21.22 (5.76)	16.00 (7.72)
	Post	33.13 (10.48)	35.80 (14.41)
Satisfaction	Baseline	19.33 (5.94)	16.67 (9.40)
	Post	32.88 (11.47)	35.40 (15.24)
Environmental barriers	Baseline	85.44 (22.47)	58.67 (35.01)
	Post	19.75 (16.96)	18.40 (10.29)

Note. Mean (SD)