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ORIGINAL RESEARCH

Randomized Controlled Trial of the Effect of Additional Functional Exercise During Slow-Stream Rehabilitation in a Regional Center

Carol Parker, MHS,[a] Keith Hill, PhD,[b] Janet Cobden, MHS,[c] Megan Davidson, PhD,[a] Helen McBurney, PhD[d]

From [a]La Trobe University, Bundoora, Victoria; [b]Curtin University, Perth, Western Australia; [c]Inglewood and Districts Health Service, Inglewood, Victoria; and [d]Monash University, Melbourne, Victoria, Australia.

Abstract

Objective: To evaluate whether adding functional exercise training to standard physiotherapy during residential slow-stream rehabilitation (SSR) improves discharge outcomes and functional ability.

Design: Randomized controlled trial.

Setting: A regional hospital.

Participants: Older people (N = 60) admitted to SSR.

Intervention: All participants received standard physiotherapy. An individualized functional incidental training (FIT) program was implemented for intervention participants consisting of 4 extra episodes of functional exercise daily for the period of SSR. Research assistants visited twice weekly to practice and progress FIT programs.

Main Outcome Measures: Outcome measures included discharge destination, participant-expected discharge destination, and functional tests of the Berg Balance Scale (BBS), de Morton Mobility Index (DEMMI), and 5 times sit-to-stand test (FTSTS) at admission and discharge.

Results: Fifty-two participants completed the study. At baseline, the SSR group achieved higher scores on the BBS, DEMMI, and FTSTS. There was no significant difference in discharge destination between groups ($P = .305$). The difference in functional change between groups from admission to discharge on the BBS, DEMMI, and FTSTS was not significant. Participant-expected discharge destination was significantly associated with eventual discharge destination ($\chi^2_1 = 8.40$, $P = .004$).

Conclusions: Adding FIT to standard physiotherapy did not improve discharge outcomes and did not have a statistically significant effect on function, but may have a small effect on balance. Patient expected and actual discharge destinations were associated.

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From 2010 to 2050 it is expected that the world population of people aged ≥65 years will grow from an estimated 524 million (8%) to 1.5 billion (16%).[1] In Australia, as in the United States[2] and the United Kingdom,[3] older people are admitted to the hospital in greater numbers than their younger counterparts. From 2011 through 2012, 39% of all Australians leaving hospital and 48% of hospital patient-days were recorded for those older than 65 years.[4] During hospital admission, the functional abilities of older people may decline,[5] which may lead to a transition from the hospital to a residential aged-care facility rather than back into the community.[6] Those people moving to long-term care tend to have longer hospital lengths of stay.[6]

One of the responses of the Australian Government to these increasing needs for elderly health care has been to commence the Transition Care Program (slow-stream rehabilitation [SSR]). Admission to SSR may take place when medical stability is achieved at the completion of an acute or subacute episode in the hospital for originally community-dwelling older people. A short-term low-level package of individualized services including at least some therapy, nursing support, or personal care is provided.

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SSR is goal oriented and time limited, and aims to maximize functional recovery while giving people time to consider their long-term care options,[7] therefore possibly delaying the need for admission into residential aged-care facilities. To access SSR, an aged care assessment needs to be conducted that determines a need for residential aged care.[8] The SSR program can be provided at home in the community or in a home-like residential setting when overnight care is necessary.

In Victoria, 27.4% of people leaving the SSR have been discharged back into the community with or without services.[9] This is a lower percentage than those found in other parts of Australia and is considered at least in part to be because Victorian participants tended to be more disabled. Although discharge back into the community is related to several factors, functional capacity appears to be the best single predictor,[10] with those people entering high-level residential care having the lowest functional abilities.[9] For frail older people who have had an acute or subacute hospital episode of care, important changes in function might influence their level of dependence and ability to return home.

Functional exercise for some older people has been found to be more effective with longer preserved effects than resistance exercise when activities of daily living and independence are the focus.[11] Functional incidental training (FIT) was an approach developed by Schnelle et al[12] for frail nursing-home patients and focused on frequent short bouts of functional exercise because of the inactivity and deconditioning common in this population. FIT has been associated with improvements in measures of endurance, muscle strength, and prevention of decline in mobility as well as improvements in measures of incontinence and agitation in residential care samples.[12,13]

The aim of this study was to investigate whether adding functional exercise (using a FIT program) to the standard physiotherapy program during a residential SSR episode would assist more people to be discharged home. A secondary aim was to assess whether participant-expected discharge destination (PEDD) at admission to SSR was relevant to final discharge destination. A further aim was to assess whether the addition of FIT led to statistically significant or clinically important changes in function. We hypothesized that more people in the FIT group would be discharged home and that the FIT participants would achieve greater increases in their functional scores than the participants in the standard Transition Care Program (TCP).

Methods

This study was a randomized controlled trial that took place in a regional center in Victoria, Australia. There were 39 residential SSR places available. Participation requirements were written consent, residence in the local area, and acceptance of a residential SSR place. Eligibility for an SSR place included admission to the hospital from living independently at home, completion of a hospital care episode, medical stability, and an assessment that further personal care service was required to be provided in residential aged care.[14] Participants were also assessed as potentially benefiting from time to consider care options and additional therapeutic services. No diagnostic groups were excluded, and age of eligibility was not specified. People with cognitive impairment were eligible. Cognitive status of potential participants was measured by assessing health professionals using the Mini-Mental State Examination before referral to the researcher.

Ethics approval was received from La Trobe University and Bendigo Health. The study was registered with the Australian New Zealand Clinical Trials Registry.

Recruitment took place over an 18-month period. Assessment took place at admission to residential SSR and at discharge. Initial assessments were completed before randomization by the treating physiotherapist. Training was undertaken to facilitate interrater reliability. Randomization, using random numbers designating group and inserted in sealed opaque envelopes, was undertaken by an independent researcher with no patient contact.

It was not possible to blind the participants or therapists to group allocation during the intervention. Both groups received individualized standard physiotherapy programs within the SSR dependent on initial physiotherapist assessment findings. Standard physiotherapy comprised twice-weekly 1:1 treatments with a physiotherapist as well as appropriate classes such as chair based, balance, or hydrotherapy. Both groups were treated by the same physiotherapists, who were encouraged to treat all participants equally regardless of group. The FIT group also received an individualized functional exercise program. The initial FIT program was developed by the participant's physiotherapist and primarily targeted walking and sitting-to-standing exercises that participants were encouraged to practice 4 times daily, in addition to necessary movement such as moving to and from the meal room. The distance a participant could walk was measured, and the number of sit-to-stand repetitions that could be accomplished was counted, with the aim being for 75% of this amount to be achieved at each exercise session. The FIT was delivered by a research assistant who was a trained allied health assistant. The research assistant visited the participants twice weekly for 30 minutes to practice the FIT, in addition to reassessing weekly and updating the target walking distance and number of sit-to-stand exercises. Staff in the care homes were asked to remind individuals in the FIT group to do their exercises. Details regarding the program were written on posters on the participant's individual bedroom and bathroom wall and inside a book placed in the bedroom with written and regularly updated instructions.

Outcome measures

The primary outcome measures were discharge destination and PEDD, which participants were asked on admission to nominate as home or long-term care.

Secondary outcome measures of function were the de Morton Mobility Index (DEMMI), the Berg Balance Scale (BBS), and the 5 times sit-to-stand test (FTSTS). The DEMMI is a clinician-observed functional measure of 15 items, with a raw score of 0 to 19, which is then Rasch converted to a score of 0 to 100, where higher scores indicate better performance.[15] Absolute interrater and intrarater reliability were found to be 9.51 and 7.54 points, respectively, on the 100-point scale, as expressed as minimal detectable change with 90% confidence when tested with elderly acute medical patients.[16] Minimum clinically important differences have been calculated in a geriatric evaluation and management cohort of patients by the distribution-based method by

List of abbreviations:

BBS	**Berg Balance Scale**
DEMMI	**de Morton Mobility Index**
FIT	**functional incidental training**
FTSTS	**5 times sit-to-stand test**
PEDD	**participant-expected discharge destination**
SSR	**slow-stream rehabilitation**
TCP	**Transition Care Program**