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Original Study

Mobility of Vulnerable Elders Study: Effect of the Sit-to-Stand Activity on Mobility, Function, and Quality of Life

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A B S T R A C T

Objectives: The aim of this study is to assess the effect of the sit-to-stand activity on the mobility, function, and health-related quality of life of nursing home residents with dementia.
Design: A longitudinal quasi-experimental intervention study with intervention and control groups.
Setting: The study was conducted in 7 nursing homes (4 intervention; 3 control) in Edmonton, Canada.
Participants: Eligible residents had a diagnosis of dementia and were able to transfer independently, or with the assistance of 1 person.
Intervention: Health care aides prompted residents to repeat the sit-to-stand activity daily during care routines on day and evening shifts.
Measurements: Mobility was measured using the 30-second sit-to-stand test and the time to complete one sit-to-stand. Function (Functional Independence Measure), health status (Health Utilities Index Mark 2 & 3) and disease-specific quality of life (Quality of Life–Alzheimer's Disease instrument) were also measured. Outcome measures were collected at baseline, and at 3 and 6 months. The covariates cognition, depression, and medical instability were derived from the Resident Assessment Instrument Minimum Data Set (Version 2.0), and the facility context covariate was measured using the Alberta Context Tool.
Results: A total of 111 residents completed the 6-month trial (56 intervention; 55 control). Residents in the intervention facilities maintained mobility, as measured by the time to complete one sit-to-stand ($P = .01$), and experienced a slower functional decline, as measured by the Functional Independence Measure ($P = .01$), from baseline to 6 months compared with residents in the control facilities, after adjusting for age, sex, cognition, depression, medical instability, and context.
Conclusions: Maintaining the ability to transfer using the sit-to-stand activity is a promising means of optimizing the mobility and function for residents with dementia in nursing homes.

Introduction

The mobility of older adults with dementia often declines following admission to a nursing home.[1,2] Sedentary behavior and limited mobility, common among older adults in nursing homes, can contribute to disability in activities of daily living[3] and increased need for personal care. Furthermore, those with reduced mobility are more

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likely to experience adverse events such as falls, incontinence, pressure ulcers, and pneumonia, all of which reduce quality of life[4] and exponentially increase the cost of resident care.[5–7] Therefore, interventions directed at improving mobility and activities of daily living are an important research focus. Recent reviews of rehabilitation in long-term care[8] and exercise programs for people with dementia[9] found significant beneficial effects for activities of daily living, with some studies also reporting improvements in mobility.[9]

The ability to stand up and sit down is fundamental to most basic activities of daily living such as toileting or dressing. Studies including the sit-to-stand activity as a part of a larger intervention package demonstrated improved outcomes such as balance, reduced falls risk, muscle strength, and overall activity pattern.[10–12] In a pilot study, integrating the sit-to-stand activity into daily care routines of nursing homes resulted in improved resident mobility.[13] The sit-to-stand activity is a practical intervention that possesses many attributes necessary for easy adoption:[14] relative advantage (minimal training needed); compatibility (existing routines and equipment); low complexity (low cost and minimal time to complete); trialability (easily tried and adapted); and, observability (visible outcome).[14] This Mobility of Vulnerable Elders study, examined the effect of the sit-to-stand activity delivered by direct care providers, health care aides, on the mobility, function, and health-related quality of life of nursing home residents with dementia.

Methods

The protocol for this repeated measures, quasi-experimental study is summarized below and published in more detail elsewhere.[15] It was hypothesized that mobility, activities of daily living, and quality of life for residents in the treatment facilities would be maintained or improved from baseline to 6 months, compared with residents in the control facilities.

Recruitment

Four intervention and 3 control urban nursing homes were recruited and matched according to ownership status and size. Participating treatment facilities agreed to introduce the sit-to-stand activity as part of the expected role for HCAs. Thus, the integration of the sit-to-stand activity into daily care routines became an expectation. Although implementing the interventions into their daily practice was not voluntary for HCAs, their participation in proxy research interviews was voluntary. HCAs were approached by a research assistant to participate in the study during unit meetings. HCAs provided informed written consent prior to each research interview.

Eligible residents were over the age of 65 years, had a diagnosis of Alzheimer's disease, vascular or mixed dementia, and were able to transfer independently or with a 1-person assist. Residents who were seriously ill or at the end of life were excluded from participation. Unit managers or their designees approached the authorized representatives or family members of eligible residents using a standard script for permission to provide their contact information to the researchers. Then, a research assistant explained the study and obtained informed written consent from the authorized representatives for these residents. Assent of the residents to participate in the study was assessed by residents' willingness to participate in the outcome measurements at baseline, 3 months and 6 months. The University of Alberta, Health Research Ethics Board approved the study.

Intervention

The sit-to-stand activity is repeating the action of standing up from a seated position and sitting down in a controlled manner. HCAs (health care aides) in the intervention group prompted and encouraged residents to repeat the sit-to-stand activity during their daily care routines (eg during dressing or toileting) a total of 4 times each day: twice on day shift and twice on evening shift.[16,17] The timing and location of the activity was at the discretion of the HCAs. The HCAs had a target number of repetitions for each participating resident to complete on each of the 4 occasions; however, the actual number of repetitions completed depended on resident ability, fatigue, and motivation. Individualized target numbers of sit-to-stands for each resident were identified during the baseline mobility assessments completed by a research assistant. Control group residents received usual care. Safety was monitored using the monthly falls logs of all 7 of the participating facilities by comparing the number of falls before and after the commencement of the study and between the 2 groups.

Procedure

During 20-minute small group sessions, almost all full-time, part-time, and casual health care aides working on day or evening shifts received training for the sit-to-stand activity. From May 2011 to March 2012, 1 research nurse educator completed 58 sit-to-stand training sessions with 196 health care aides in the 4 intervention facilities. HCAs on vacation or on a health or maternity leave during the education sessions were provided this education upon their return. Thirty-nine nurses and allied health professionals also attended the training sessions. The brief, interactive education sessions incorporating adult learning principles included instruction and practice of the sit-to-stand activity, documentation of the activity on flowsheets, and safe transfer techniques. In the treatment nursing homes, the research nurse educator used monthly strategies to maintain a focus on the sit-to-stand activity (eg paper-based reminders) and to respond to questions of the HCAs (eg flowsheet information sessions).

Monthly flowsheets integrated into the health records included each resident's individualized target number of repetitions, and flowsheets were intended to be completed by health care aides at the end of each shift. These flowsheets were used to monitor the enactment fidelity[18] of the intervention by assessing the number of occasions that the residents actually completed the sit-to-stand activity, and the number of sit-to-stands that they completed on each occasion. Data were collected from July 2011 to February 2013.

Measures

Resident mobility, function, and quality of life were measured at baseline, 3 and 6 months. Resident covariates were gathered at baseline. Research assistants measured participant mobility using the 30 second sit-to-stand test[10,11,19] and the time to complete one sit-to-stand-to-sit.[20] Health care aides who worked with participating residents in the previous week, completed 30-minute proxy interviews for function and quality of life. Function was assessed using the 18-item Functional Independence Measure (FIM),[21–23] a 7-point scale from 1 (dependent) to 7 (independent), with total scores ranging from 18 to 126. The FIM physical subscale includes self-care, sphincter control, transfers, and locomotion items with total scores ranging from 13 to 91. Health-related quality of life was measured using the Health Utilities Index (HUI) Mark 2 & 3.[24] Total scores on the mobility attribute of the HUI Mark 2 & 3 range from 1 (no disability) to 5 (severe disability). Dementia-specific quality of life was measured using the Quality of Life—Alzheimer's Disease.[25,26] Total scores on the 15-item caregiver version, including items such as energy and mood, range from 15 to 60 with higher scores reflecting better quality of life.