Project Implementation Paper

Preventing falls in assisted living: Results of a quality improvement pilot study

Sheryl Zimmerman, PhD [a,b,*], Angela Greene, MS, MBA [c], Philip D. Sloane, MD, MPH [a,d], Madeline Mitchell, MURP [a], Carol Giuliani, PT, PhD [a,e], Kirsten Nyrop, MACT, PhD [f], Edith Walsh, PhD [c]

[a] Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill, USA
[b] School of Social Work, University of North Carolina at Chapel Hill, USA
[c] RTI International, USA
[d] Department of Family Medicine, School of Medicine, University of North Carolina at Chapel Hill, USA
[e] Department of Allied Health Sciences, Division of Physical Therapy, University of North Carolina at Chapel Hill, USA
[f] School of Medicine, University of North Carolina at Chapel Hill, USA

ARTICLE INFO

ABSTRACT

Residents of assisted living (AL) communities are at high risk for falls, which result in negative outcomes and high health care costs. Adapting effective falls prevention programs for AL quality improvement (QI) has the potential to reduce falls, improve resident quality of life, and reduce costs. This project tested the feasibility and outcomes of an evidence-based multi-component QI program, the Assisted Living Falls Prevention and Monitoring Program (AL-FPMP). Resident posture and gait improved, likely due to exercise and/or physical therapy. Effective falls prevention QI programs can be implemented in AL, and are advised to (1) establish and maintain a falls team to create a culture focused on the reduction of falls risk; (2) teach staff to assess residents using the Morse Falls Scale to increase their awareness of residents' falls risk and improvement; and (3) modify existing exercise programs to address balance and lower body strength.

Introduction

Fifteen percent of older adults who reside in assisted living (AL) communities fall each year.[1] Multiplying this figure by the 733,300 people who live in the 31,100 AL communities across the country[2] conveys the true scope of this issue — almost 110,000 people falling annually. Injuries from falls can result in chronic pain, disability, dependence, and death; although injury rates for AL residents are not available, in nursing home populations, one-third of falls result in minor injuries, and 12–16% result in major injury.[3,4] Falls also are expensive; AL residents who fall and experience a hip fracture or other major injury are between two and five times more likely to be hospitalized,[1] with hospital costs averaging $35,000 per event.[5]

Not surprisingly, AL residents exhibit numerous risk factors for falls, including older age, muscle weakness, gait and balance deficits, use of assistive devices, a history of falls, visual deficits, arthritis, depression, and cognitive impairment; also, they take medications that put them at risk, and encounter environmental hazards such as cluttered hallways.[6,7] Hundreds of clinical trials have tested falls prevention strategies in various settings, amassing evidence that multi-component prevention programs that address multiple risk factors evidence positive outcomes.[8,9] Given the evidence, advocates have stressed the necessity to actively diffuse falls reduction programs into clinical practice; identify and reduce barriers to implementation; and train providers to implement falls risk assessment and management.[8] Such recommendations extend to AL, specifically

through the development of quality improvement (QI) programs that assess and address the falls risks of this population.[10]

When developing a falls prevention QI program for AL, the components must be tailored to the residents who are generally more impaired than those in the community but less impaired than those in nursing homes — for example in relation to hypertension, depression, congestive heart failure, and dementia[11] — although data also indicate that quality of life is higher in AL than for community-dwelling older adults who use long-term services and supports.[12] The program also must be tailored to the setting; almost half of AL communities do not have nurses (54% of residences have an RN or LPN on staff, with 39% and 33% having an RN or LPN, respectively),[13] and they provide fewer health services than do nursing homes.[14] Recent work suggests that compared to nursing homes, QI programs in AL may be facilitated by fewer regulations, but challenged by a limited number of supervisory staff and numerous off-site medical providers serving their residents.[15] In addition, monthly pharmacy review is not mandated (an important consideration given the falls-related risks of medications), physical therapists are not regularly available (which can hinder assessment and referral),[16] and settings exhibit great variability, meaning that a QI intervention must include processes that are as generalizable as possible.

Therefore, the aims of this pilot study were to develop and evaluate the feasibility and outcomes of an evidence-based multi-component falls prevention and monitoring QI program in AL, which addressed resident function, medication use, and environmental modification to reduce fall risk. Results are useful to inform not only the adoption of a falls prevention program in AL, but also the potential benefits in terms of reduced falls.

Material and methods

Design

Settings

Four AL living communities in North Carolina, two each from two chain-operated corporations, were recruited to participate in the study. Within each pair of sites, one was randomly selected to be an intervention site, with the criterion of eligibility being that the administrator agree to actively participate in the falls prevention and monitoring program and adopt it as the standard of care. The other site served as a control, and received an onsite in-service educational session related to falls prevention at the conclusion of the project. After one of the control sites was assigned, administrative turnover resulted in the need to identify and recruit a replacement within the same chain.

Subjects

All AL residents were intended to be involved in the QI program given that it became the standard of care. For purposes of evaluation, subjects included a target sample of 50 eligible residents per AL community (intervention and control), a figure established in consideration of the budgetary constraints of the project. To be eligible, a resident had to be 65 years of age or older, English speaking, not bed-bound, not residing in a dementia unit, and not a hospice patient at baseline. Research staff visited each resident to obtain consent; if residents were unable to provide their own consent (based on cognitive status), family proxies did so on the residents' behalf, and residents were enrolled if they assented to participate. Consent allowed for subjects to refuse to answer some questions or to not participate in all components of the study if they so chose. Research procedures were approved by the Institutional Review Boards of the University of North Carolina at Chapel Hill and RTI International. The quality improvement project was conducted

over four months and the evaluation compared change in resident risk factors for falls (function and medication use).

Data collection

Data were obtained by trained research staff by way of observation, chart review, and interviews with AL staff and residents, at baseline and four months after implementation of the QI program and at the same time in control sites. In addition to identifying change in resident risk factors, the investigative team conducted in-depth qualitative interviews at the end of the four month intervention with staff involved in the AL program, to learn about program implementation (e.g., the extent to which assessments were conducted and exercises provided, and facilitators for and obstacles to implementation); also, research staff observations during the conduct of the intervention informed the implementation analyses.

Measures

Falls risk related to function was assessed using the Morse Falls Scale[17] and Timed Up and Go (TUG) Test.[18] Scored 0—110 (low risk = 0—9, moderate = 10—25, high = 26—110), the Morse determines risk based on falls history, need for walking assistance, attachment to medical equipment, gait, and mental status; in prior work, it has correctly classified and differentiated fallers.[17] The TUG asks residents to stand from a chair, walk 10 feet, and return to the chair; it is scored based on time to completion and has cut-points related to falls risk (low risk = 0—9.9 s, moderate = 10—19.9 s, high = $\geq$ 20 s). Both sensitivity and specificity of the TUG for identifying elderly persons who are prone to fall are 87%.[18] Falls risk related to medications was derived from the GRAM software obtained at baseline and follow-up (further described below). Other data included impairment in activities of daily living (ADLs) using the Minimum Data Set Activities of Daily Living scale (MDS-ADL; range 0—28)[19]; cognition using the Minimum Data Set Cognition Scale (MDS-COGS; range 0—10)[20]; affect using the Cornell Scale for Depression in Dementia (CSDD; range 0—38)[21]; and comorbidities based on the number of chronic health conditions from a list of 20 common conditions. Additional data pertained to resident demographics and characteristics of the AL settings.

Analyses

Descriptive statistics characterized the sample, including fall risk factors at baseline and follow-up. Difference-in-differences multivariate regression models evaluated the effect of the intervention on outcomes (i.e., Morse score, TUG score, and number of prescribed medications that increase falls risk). In these models, the average change at follow-up in the control group was subtracted from the average change at follow-up in the intervention group; this strategy removes biases in comparisons between groups that could be due to baseline differences and unmeasured trends. All three models controlled for resident age, gender, race, comorbidities, and functional, cognitive and affective status; in addition, the number of medications associated with falls risk was included as an independent variable in the Morse and TUG models because they can affect physical performance. All analyses were conducted using SAS version 9.2; the difference-in-differences analyses were conducted using GLM.

Quality improvement intervention

The Assisted Living Falls Prevention and Monitoring Program (AL-FPMP) was based on efficacious fall prevention interventions conducted in NHs[22] and publicly available screening measures. Specifically, it was based on the Falls Management Program, which includes detailed, straightforward protocols and communication