Adopting the Fall Tailoring Interventions for Patient Safety (TIPS) Program to Engage Older Adults in Fall Prevention in a Nursing Home

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ABSTRACT

Background: Falls are the leading cause of injury-related hospitalizations and deaths among older adults globally.
Local problem: About 24% of Canadian nursing home residents fall annually. This quality improvement project evaluated the impact of the Fall Tailoring Interventions for Patient Safety (TIPS) program on preventing falls and fall-related injuries among older adult nursing home residents in a subacute care unit in Canada.
Methods: We used the Standards for Quality Improvement Reporting Excellence (SQUIRE) 2.0 guidelines for reporting. The intervention site is a 15-bed subacute care unit within a government-funded nursing home.
Intervention: The Fall TIPS program was adapted to a nursing home setting to prevent falls. It provides fall prevention clinical decision support at the bedside.
Results: The rates of falls and injuries decreased after implementing the Fall TIPS intervention.
Conclusion: Engaging nursing home older adult residents in fall prevention is crucial in translating evidence-based fall prevention care into clinical practice.
Keywords: fall prevention, Fall TIPS program, nursing home, patient engagement, patient-centered outcomes research

Falls are the leading cause of injury-related hospitalizations and death among Canadian older adults.[1] The overall fall rate in older adult nursing home residents in Canada was 16.7%. The fall rate of older adult nursing home residents in Saskatchewan, a western province in Canada, where this project was conducted, increased from 12.7% in 2015 to 14.6% in 2018,[1] a distressing upward trend in a vulnerable population.[1] Thus, preventing falls and fall-related injuries in this population is an important public health priority in Canada.[1]

Dykes and associates[2,3] found that fall prevention is a 3-step process: (1) conducting a fall risk assessment; (2) developing a tailored or personalized fall prevention plan; and (3) consistently implementing the plan. To prevent falls, patients must be actively engaged in all 3 steps of the fall prevention process.[4,5] The Fall Tailoring Interventions for Patient Safety (TIPS) program facilitates patient engagement in the 3-step fall prevention process consistently.[6] Evaluation of the Fall TIPS toolkit in a randomized controlled trial with more than 10 000 patients in 4 hospitals in the United States revealed a 25% reduction in patient falls.[5] A subsequent study in 3 academic medical centers found that engaging patients and family in the 3-step fall prevention

process using Fall TIPS was associated with a 15% reduction in falls and 34% reduction in fall-related injuries.[4]

The purpose of this quality improvement project was to evaluate the impact of the Fall TIPS program on preventing falls and fall-related injuries among older adult nursing home residents in a subacute care unit located in a western province in Canada. The project team, including a patient partner, 5 clinician partners, and 6 researchers, was informed of the Fall TIPS program and committed to partnering to pilot the Fall TIPS program and evaluating its effectiveness in older adult nursing home residents in Canada. This project used a pre- and postintervention study design. Patient-centered outcomes research (PCOR) methods were used in all phases of the project (eg, Fall TIPS program adaption, conducting qualitative interviews, data dissemination). PCOR is defined as a method that helps people "communicate and make informed health care decisions, allowing their voices to be heard in assessing the value of health care options."[7] The long-term goal of this research is to conduct an efficacy study to determine whether the adapted Fall TIPS program works better than the typical nursing home fall prevention program to decrease falls and fall-related injuries among older adult residents.

AVAILABLE KNOWLEDGE AND RATIONALE

In Canada, about 200 000 older adults live in nursing homes (also called long-term care facilities).[1] Only one of 15 nursing home residents is younger than 65 years, and about 50% are 85 years and older.[1] About 24% of Canadian nursing home residents fell, and 13% (range, 7%-17%) of them experienced a fall in the 30 days following assessment.[1] Falls are defined in the Seniors' Falls in Canada: Second Report[8] as "a sudden and unintentional change in position resulting in an individual landing at a lower level such as on an object, the floor, or the ground, with or without injury."

Among adults 65 years and older in the United States, falls accounted for 56.8% of total unintentional injuries and were the seventh leading cause of death.[9] Falls are the most common cause of traumatic brain injury in older adults, accounting for 50% of fall-related deaths in this population.[10] In addition to injuries, falls can result in the development of a fear of falling, anx-

iety, decreased mobility, social interaction, and decreased quality of life among older nursing home residents.[1]

This project's rationale is that fall-related injuries and death are preventable by managing physiological fall risk factors.[11] The research team will translate knowledge from the Fall TIPS program in acute care settings in the United States to a nursing home setting in Canada. We hypothesize that the personal impact of falls among nursing home older adult residents can be prevented by implementing injury prevention actions tailored to individual patient needs and engaging patients and families in fall prevention care.[5,12] Fall TIPS could successfully decrease injurious falls, mainly by a patient-centered approach and collaborative partnership between staff and patients.[5,13]

METHODS

We reported this quality improvement project using the Standards for Quality Improvement Reporting Excellence (SQUIRE) 2.0 guidelines.[14] This project was approved by the University of Saskatchewan's Research Ethics Board. All participants provided verbal informed consent before data collection. The research team included a patient partner, 5 clinician partners (licensed nurses and continuing care assistants), and 6 researchers.

Context

The project site is a 15-bed subacute care (transitional care) unit within a government-funded nursing home located in Saskatchewan, Canada. This nursing home is a 225-bed long-term care facility and opened in 2016, including twenty-one 10-bed units for permanent stay (ie, homes for the residents) and one 15-bed unit for rehabilitation, hospice, palliative, and respite care (similar to a post–acute rehabilitation unit in the United States).[15] This nursing home is staffed with full-time registered nurses, licensed practical nurses, continuing care assistants (similar to home care aids), physical therapists, occupational therapists, dieticians, pharmacists, and on-call physicians. Licensed nurses are all unionized with a comparable salary across care settings.[15,16] Canada's health care system is publicly funded.[16,17] Each province sets a flat rate for nursing home residents based on their income. On average, the resident charges represent about

23% of the total cost of the individual's care and accommodation.[18]

Intervention

The evidence-based intervention applied in this project was the Fall TIPS program. It is a standardized fall prevention toolkit that has been adopted in acute care hospitals and long-term care facilities in the United States. The Fall TIPS program has been shown to reduce patient falls during acute care hospital stays.[5] Using this program, nursing staff may modify fall prevention interventions based on daily assessments of the patients.[5] The Fall TIPS toolkit can be used as a personalized fall prevention plan displayed on screens by patients' bedsides and on printed personalized bedside posters and educational handouts.

This project used laminated bedside posters printed on A3 paper (11.7×16.5 in). The poster was updated through a series of focus group sessions and individual interviews with older adult residents, nursing staff, and family members. The residents appreciated the friendly icons in the poster print display, with a colored box to select the communicated fall prevention plan tailored to each older adult resident. This clinical decision support tool was posted at the patient's bedside to help nursing staff and residents identify evidence-based interventions for each area of risk and updated as needed when the resident's fall risks changed.

The Fall TIPS poster in the Supplemental Digital Content, Figure (available at: http://links .lww.com/JNCQ/A834) was the version used for the intervention with the nursing home's residents. This A3 size poster is laminated and can be cleaned and reused multiple times. After nursing staff review this poster with residents and mark the applicable fall risks and targeted fall interventions, the marked poster is attached to the whiteboard on the wall next to each resident's bed.

The Fall TIPS resources required to implement the intervention are available at the official Fall TIPS website (https://www.falltips.org). This website includes information about this patient-centered fall prevention toolkit, steps to ensure success with implementation, and stories of successful Fall TIPS implementation. Resources may be obtained at no charge by contacting the corresponding author via the Fall TIPS website.

Project design and procedures

The kickoff meeting was held at the intervention nursing home on September 20, 2018. Two researchers participated virtually from Boston, Massachusetts. The research team subsequently met weekly to plan the activities. The research team included a patient partner, who actively engaged in the project design, planning, and implementation (ie, assisting with the staff education sessions, conducting interviews with residents and family members). We integrated knowledge translation and mobilization approaches for the residents, family caregivers, and clinicians throughout this project's 4 phases, which are described as follows.

Project phase 1: Workflow analysis

One researcher observed the workflow of the intervention nursing home over 5 days in December 2018, namely, the information-sharing modalities used by staff, shift changes, processing, and admission of older adults into the intervention unit for respite care, documentation of processes, team decision making, development of resident care plans, resident flow sheets, notes on whiteboards, and fall incident reports from preceding months. Our patient partner and one researcher conducted a focus group discussion with the nursing home's administrators, managers, nursing coordinators, and nursing staff to learn their experiences in preventing falls (ie, strengths, weaknesses, opportunities, threats, barriers, and facilitators).

Our patient partner and one researcher also conducted individual interviews with 3 residents and their family members regarding their experiences with falls in and outside the nursing home (ie, their perception of falls, fall risks, and fall prevention strategies). The 3 interviewed residents included 1 male aged 72 years old, 1 female aged 54 years old, and 1 female aged 47 years old. The feedback from residents and family members was positive; they expressed that they understood the Fall TIPS poster intuitively and saw the need for an individualized fall prevention plan. Residents also acknowledged that engaging in constructing their fall prevention care plans was a motivating factor for compliance. The data were analyzed and used in phase 2.

Project phase 2: Design and development

The research team prioritized the common themes from the focus group discussion and

interviews and then mapped to the Fall TIPS 3-step fall prevention process. Along with the intervention unit's nursing staff, we defined the contents of the Fall TIPS poster (see Supplemental Digital Content Figure, available at: http://links.lww.com/JNCQ/A834), display, and workflow integration strategies. Two new icons (wheelchair and mobile sleeve for lift residents) were added to the laminated Fall TIPS poster based on staff and resident input. The poster was reviewed and completed jointly by the resident and the responsible nurse. Then the poster was placed at the resident's bedside. The research team refined and revised the Fall TIPS prototype with the residents, family members, and staff at the intervention unit. We had multiple iterations of the "develop-test-revise" loop to ensure that the final prototype met the usability considerations.

Project phase 3: Implementation

The go-live date was set on April 1, 2019. Two researchers delivered a virtual staff training session on February 16, 2019. Two peer champion volunteers (one registered nurse and one continuing care assistant) were responsible for training other nursing staff members who missed the first training and reported audits using the Fall TIPS webpage (https://www. falltips.org). The staff training comprised patient engagement within the 3-step fall prevention process, conducting a fall risk assessment using the Morse Fall Scale,[19] and interactive case studies to complete the 3-step fall prevention process within the framework of the Fall TIPS. Fall TIPS went live on April 1 as planned. We used general principles from Lean and Six Sigma to support implementation.[20,21]

Project phase 4: Evaluation

Evaluation commenced 1 month after the first staff training using the peer champion model and ran concurrently for 8 months, along with phase 3. The primary outcomes used to assess the changes before (April-December 2018) and after implementing the adapted Fall TIPS intervention (April-December 2019) were the percentage of residents who experienced any falls per 1000 resident-days and the percentage of residents who experienced falls with injuries per 1000 resident-days. The fall data (ie, fall incidents, injury levels, and circumstances that led to fall incidents) were retrieved from the monthly fall

incident summary reports. The injury level of each fall was categorized by the nurse as follows: level 1 = no injury; level 2 = minor injury; level 3 = adverse outcome or significant potential for adverse outcome; and level 4 = tragic accident leading to litigation.

Two peer champion volunteers interviewed 4 residents during project phase 3 to ensure the implementation quality and compliance of the Fall TIPS program (ie, actively engaging residents in the Fall TIPS program delivery, the marked posters were posted in residents' rooms and updated if residents' fall risks changed). The compliance rate to the Fall TIPS program was 100%.

Data collection and analysis

Qualitative data (notes were taken in project phases 1 and 2) from the focus group discussion, and individual interviews with the residents and their family members were typed into a Word file for thematic and descriptive content analyses. Quantitative data (fall data for project phase 4) were entered into Statistical Package for the Social Sciences (SPSS) version 25 (IBM, Armonk, New York) file for descriptive analyses (ie, means, frequencies, and percentages).

Monthly fall rates and rates of injurious falls per 1000 resident-days were calculated and compared for clinical significance between the preimplementation (8 months) and postimplementation (8 months) periods. Fall data were abstracted from the monthly nursing home reports because individual resident-level data were not available for the researchers. The residents' demographic characteristics and the ones who fell were not reported here. This pilot included 8 data points for the pre- and postimplementation periods each to observe the clinically relevant changes as a quality improvement project.

RESULTS

As shown in Table 1, both the average fall rates and rates of injurious falls per 1000 resident-days were lower after implementing Fall TIPS intervention in the intervention unit. All injurious falls were minor. Because of the limited data points, we did not conduct statistical analyses to compare the monthly fall and injurious fall rates before and after implementation. As presented in Table 2, the most frequent cause of falls before implementation was self-transfer (44.4%; n = 12), followed by unwitnessed falls (14.8%;

Table 1. Summary of the Average Fall Rates and Injurious Fall Rates per 1000 Resident-Days Before[a] and After[b] Implementing the Adapted Fall TIPS Program

Timeline	Average Monthly Fall Rate; Range	Average Monthly Injurious Fall Rate; Range	Average Monthly Fall Rates by Injury Levels[c] (Total Number of Falls); Range of the Number of Falls
Before	10.07; range: 0-17.18	2.91; range: 0-12.20	Level 1: 2.1 (N = 19 falls); range per month: 1-3
			Level 2: 0.9 (N = 8 falls); range per month: 2-4
After	7.95; range: 0-19.35	1.01; range: 0-4.69	Level 1: 1.9 (N = 17 falls); range per month: 1-5
			Level 2: 0.3 (N = 3 falls); range per month: 0-1

[a] April-December 2018; 27 falls, 8 injurious falls.
[b] April-December 2019; 20 falls, 3 injurious falls.
[c] Level 1 = no injury, level 2 = minor injury, level 3 = adverse outcome/significant potential for adverse outcome, and level 4 = tragic accident leading to litigation. No falls in level 3 and level 4.

n = 4). Poor balance was recorded as the most frequent cause for fall incidents postimplementation (55%; n = 11), followed by self-transfer falls (20%; n = 4).

DISCUSSION
After implementing Fall TIPS, both the fall and injurious fall rates among older adult nursing home residents were lower with clinical significance (Table 1). Table 2 shows some differences

Table 2. Frequencies and Percentages of the Circumstances That Led to Fall Incidents

	Timeline	
	Before Implementation,[a] n (%)	After Implementation,[b] n (%)
Poor balance	2 (7.4)	11 (55)
Reaching or leaning	2 (7.4)	1 (5)
Transferring with assistance	1 (3.7)	1 (5)
Self-transfer	12 (44.4)	4 (20)
On the way to the bathroom	0 (0)	0 (0)
Unwitnessed	4 (14.8)	0 (0)
Faulty equipment	2 (7.4)	1 (5)
Slipped or tripped	1 (3.7)	2 (10)
Others—not specified	3 (11.1)	0 (0)

[a] April-December 2018; n = 27 falls.
[b] April-December 2019; n = 20 falls.

in the types of falls occurring pre- and post–Fall TIPS implementation. Because of the low number of fall events and the fall data were abstracted from the nursing home's monthly report, no additional data were available to explain differences. One difference, fewer falls were due to self-transfer, could be attributed to the increased awareness of older adult residents of fall prevention interventions (eg, requesting transfer assistance for toileting needs), due to the information provided on the Fall TIPS poster (see Supplemental Digital Content, Figure, available at: http://links.lww.com/JNCQ/A834).

Regarding the lessons learned, the research team credited the nursing home leadership for fostering an atmosphere that put residents' safety first. Thus, the Fall TIPS program was quickly incorporated into the existing workflow and integrated into their electronic medical record platform to ease documentation and evaluation. The nursing staff described the ease of using the Fall TIPS toolkit and its relevance to individualized resident care. For example, the poster's graphical format and colorful structure facilitated resident engagement and practical conversations with the residents regarding their fall prevention care plans.

Limitations
High nursing staff turnover made it challenging to execute this project. This pilot did not explore the clinical relevance of the Fall TIPS program within the context of interdisciplinary workflows. The intervention nursing home and the primary academic partner were 200 km apart; this geographical separation limited regular interactions. This barrier was partially overcome

by conducting regular virtual conference calls. Also, this project included minimal statistical analysis due to the limitation of a small sample size and minimal data points as well as the fall rates being the primary unit of interest.

CONCLUSIONS

This project provides preliminary evidence that the Fall TIPS program can decrease fall and injurious fall incidents among nursing home older adult residents. Based on feedback from the nursing staff, involving older adult residents in developing their individualized fall prevention care plans is key to success. A larger study is warranted to rigorously examine the changes in fall and injurious fall rates among older adult nursing home residents, who stay in nursing homes for a limited or extend period of time in Canada.

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