

An Instructional DVD Fall-Prevention Program for Patients With Cancer and Family Caregivers

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Falls and fall-related injuries from disease and treatment side effects are significant health problems for cancer survivors (Allan-Gibbs, 2010; Given et al., 2004). Among hospital inpatients, those with cancer tend to have higher fall frequencies and higher fall injury rates (Alcée, 2000; O'Connell, Baker, Gaskin, & Hawkins, 2007). A study by Puts et al. (2013) revealed that about 20% of patients aged 65 years or older with newly diagnosed cancer report experiencing a fall at home within the first six months after diagnosis. In a study of community-dwelling older adults with cancer, Spoelstra et al. (2013) found that falls occurred at a rate of 33% in older adults with cancer compared to 29% without cancer ($p < 0.00$). Roughly 2.3 million nonfatal fall injuries were reported in the United States in 2010 among older adults treated in emergency departments, and more than 662,000 of these patients were hospitalized (Centers for Disease Control and Prevention, 2012). Falls also are a problem internationally. In the global burden of disease study conducted by the School of Population Health in Brisbane, Australia, from 1990–2010, falls were one of the leading specific causes of years lived with disability (Vos et al., 2013).

Literature Review

When individuals with cancer return home following hospitalization, their family caregivers often become actively involved in the management of day-to-day demands, including fall prevention. Family caregiving is an ongoing process that occurs in response to an illness and encompasses multiple cognitive, behavioral, and interpersonal processes (Schumacher, Beidler, Beeber, & Gambino, 2006). Because family caregivers often share responsibility for postdischarge home care of their relatives with cancer, it is essential for patient and caregiver dyads to be educated about fall risks and prevention and be prepared to perform safe mobility skills

Purpose/Objectives: Determine the efficacy of a fall-prevention skills training program for patients with cancer and family caregivers.

Design: Randomized, controlled trial with repeated measures and postintervention measure of fall occurrence.

Setting: A comprehensive cancer center in the midwestern United States.

Sample: 132 patient and family caregiver dyads.

Methods: Dyads were randomly assigned to one of two groups: a control group that received standard fall-prevention education or a treatment group that received standard education and a fall-prevention DVD program to view at home. Participants completed surveys at baseline, one week, one month, and three months. Follow-up phone calls were made at three months.

Main Research Variables: Fall occurrence, perceptions of fall risks, and fall-prevention knowledge.

Findings: Patients in the treatment group were significantly more likely to report not falling at three months than patients in the control group. The number of falls was lower for the treatment group. The difference was not statistically significant. Dyads in the treatment group showed significantly greater improvement over time in fall risk awareness and fall-prevention knowledge.

Conclusions: Mobility skills training is a promising educational intervention for reducing fall occurrences in the home for patients with cancer.

Implications for Nursing: Efforts are needed for improving the knowledge and skills of cancer survivors and their family members in recognizing patient fall risks, making home adjustments, and performing mobility skills competently.

Key Words: fall prevention; family caregiving; oncology; patient education

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in the home. Hospital discharge planning, including education of patient and caregiver dyads, is a process for ensuring patients' postdischarge needs are met to enable them to function at optimal levels in the home. In a review of best practices for improving discharge

planning and outcomes for frail older adult patients, Bauer, Fitzgerald, Haesler, and Manfrin (2009) found the role of the family to be one of the most significant factors influencing success. Family members who care for cancer survivors perceive the need for more preparation and knowledge from hospital staff at the time of discharge and have the need to learn more about caregiving skills (Adam, 2000; Schumacher et al., 2006).

The development of community-based, fall-prevention programs has proliferated (Costello & Edelstein, 2008; Gates, Fisher, Cooke, Carter, & Lamb, 2008). The literature shows promise with respect to multifactorial fall-prevention programs that combine comprehensive assessment (Clemson et al., 2004; Close et al., 1999) and targeted patient interventions, such as home health visits that include education and/or home modifications (Lightbody, Watkins, Leathley, Sharma, & Lye, 2002; Mahoney et al., 2007), exercise (Barnett, Smith, Lord, Williams, & Baumand, 2003; Toftagen, Visovsky, & Berry, 2012), and managing polypharmacy (Close et al., 1999). Although research has shown that mobility skills are among the more difficult for cancer survivors to do for themselves (Potter et al., 2010), few studies have targeted the education or direct involvement of family caregivers in fall prevention (Costello & Edelstein, 2008).

The use of electronic media in patient and family caregiver education is common. Electronic technologies in the form of videotape and interactive computer-based technologies have been used to help individuals with cancer make treatment decisions (Maslin, Baum, Walker, A'Hern, & Prouse, 1998; Sheridan et al., 2012; Whelan et al., 2003), provide health support systems (Gustafson et al., 2001), and provide information about cancer (Brown et al., 2004). These technologies have been effective and, in some cases, slightly superior to traditional educational methods (Gysels & Higginson, 2007). Studies using electronic technologies have evaluated educational outcomes on the basis of patients' perceptions or reactions to learning, but there have been limited measures of actual changes in patient behavior (e.g., fall occurrence). Interactive systems that allow users to view and decide when to opt out of a system show benefit because they facilitate involvement and active learning with information matched according to a learner's preferences and needs. However, no reports were found detailing the use of electronic technology for educating patient and family caregiver dyads about fall prevention and associated mobility skills training.

Farran (2001) argued that there was a need for more self-paced, flexible timing of educational interventions, more research examining efficacy of technology as a mode for patient and family caregiver education delivery, and a viable intervention that improves patient outcomes. This study expands on a previous feasibility

study that tested the efficacy of an instructional DVD program, *Moving Safely in the Home*, and its potential for reducing fall occurrence among outpatients in the home setting (Potter, Olsen, Kuhrik, Kuhrik, & Huntley, 2012). Development of the DVD was based on concepts within the Transactional Model of Cancer Family Caregiving Skill (Schumacher et al., 2006). The transactional model offers an excellent conceptual approach for designing a family caregiving skills training program. Patients and family caregivers partner together along a continuum of care and face multiple demands, including the caregiving skills (e.g., medication management, wound care, safe mobility) that they are expected to perform at home. As patients and caregivers face caregiving demands, such as fall prevention, they engage in processes such as monitoring, interpreting, and making decisions. The DVD developed for this study applied the transactional model in the design of lesson components and content organization. The transactional model views caregivers and cancer survivors as individuals and as dyads as they manage a continuum of care (Schumacher et al., 2006). Content in the DVD was designed to prepare a caregiving dyad to be able to understand patient fall risk, know the warning signs of fall risk, take action in performing safe mobility skills, and to know when and how to communicate with healthcare providers about fall risk-related issues.

The current study is the first clinical trial to test a fall-prevention skills training program against standard discharge fall-prevention education. In addition, the educational program is the first reported study that integrates concepts from the transactional cancer family caregiving skill model (Schumacher et al., 2006). The purpose of this clinical trial was to determine the efficacy of a fall-prevention skills DVD program for patients with cancer and their family caregivers in reducing the occurrence of patient falls in the home and in improving patient and family caregiver knowledge of fall risks and fall-prevention strategies.

Methods

Design and Sample

A randomized, controlled trial (RCT) with a repeated measures design and a postintervention measure of patient fall occurrence was conducted. Approval to conduct the study was obtained from the Protocol Review and Monitoring Committee at the Siteman Cancer Center at Barnes-Jewish Hospital and the Human Research Protection Office at Washington University, both in St. Louis, Missouri.

Hospitalized patients with cancer and their primary family caregivers (individuals identified by patients as, "The one who provides me with the most care

and support because of my cancer”) were eligible to participate. Inclusion criteria for patients included English-speaking adults who were age 18 years or older, diagnosed with cancer, and at risk for falling as determined by the Memorial Sloan Kettering Cancer Center (MSKCC) Fall Risk Assessment tool (Kline, Thom, Quashie, Brosnan, & Dowling, 2008). Patients with stage IV cancer were excluded. Eligible family caregivers were English-speaking adults who were age 18 years or older, identified by patients as their primary family caregiver, and who had access to a DVD player in the home. Family caregivers who were employed during the time of the study as healthcare professionals who had performed mobility and transfer skills in the previous five years were excluded.

The research team screened 1,371 patients to enroll 132 patient and caregiver dyads; 41% of patients screened were eligible, but 66% of those patients declined to enroll in the study because of lack of interest, limited time, or feeling fatigued or sick. About 11% did not complete enrollment procedures before being discharged from the hospital.

Instruments

A **fall calendar** was provided to all dyads at the time of enrollment. The calendar design allowed participants to enter the time of a fall occurrence, whether there was a fall-related injury, and their perception of whether any factors contributed to the fall. The total number of falls (with and without injury) was coded from the

Table 1. Sample Characteristics by Group (N = 77)

Characteristic	Overall				Treatment (n = 34)				Control (n = 43)			
	Patients		Caregivers		Patients		Caregivers		Patients		Caregivers	
	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD
Age (years)	58.4	13.4	54.6	13.4	58.6	14.6	54.7	14.8	58.2	12.6	54.5	12.4
Months as caregiver	–	–	39.5	88.5	–	–	52.5	113.8	–	–	30.1	64.4
Hours per week	–	–	92.7	74.1	–	–	81.5	75.9	–	–	101.2	72.6

Characteristic	n	n	n	n	n	n
Gender						
Male	36	24	15	13	21	11
Female	41	53	19	21	22	32
Race or ethnicity						
White	65	68	30	31	35	37
African American	10	8	4	2	6	6
Asian	1	–	–	–	1	–
Native American	1	–	–	–	1	–
Hispanic ethnicity	–	1	–	1	–	–
Missing	–	–	–	–	–	1
Work status						
Full-time	15	30	6	15	9	15
Part-time	2	5	1	2	1	3
Homemaker	5	3	2	2	3	1
Unemployed	4	7	1	2	3	5
Disabled	25	8	11	3	14	5
Retired	26	24	13	10	13	14
Education						
Less than high school	3	3	2	2	1	1
High school only	22	25	9	11	13	14
Some college	28	25	13	12	15	13
College degree	24	24	10	9	14	15
Relationship						
Spouse or partner	49	46	21	20	28	26
Parent	6	12	1	5	5	7
Child	11	5	5	1	6	4
Sibling	3	4	3	3	–	1
Dating	7	5	4	3	3	2
Friend or other	1	5	–	2	1	3
Caregiver						
Lives with patient	–	60	–	27	–	33
One year or less as caregiver	–	49	–	21	–	28
Provides 24/7 care	–	31	–	12	–	19

calendar data collected at three months, as well as the percentage of patients in each group who had at least one fall or a fall with an injury. Self-report diaries and calendars have shown excellent compliance rates; however, accuracy (under-reporting or over-reporting) remains difficult to ascertain (Costello & Edelstein, 2008).

The **Fall Risk Awareness Questionnaire (FRAQ)** (Wiens, Koleba, Jones, & Feeny, 2006) was used to assess patient and caregiver awareness and perception of general risk factors for falling. The 23-item survey yielded 49 responses scored as correct or incorrect; FRAQ total scores can, therefore, range from 0–49; higher scores indicate greater awareness of fall risks. Preliminary evidence has demonstrated construct validity of FRAQ (Wiens et al., 2006).

To assess patient and caregiver awareness and knowledge of the fall-prevention content presented in the DVD, the authors developed two new scales. The **Perceived Fall Risk Scale** included 10 questions in which patients and caregivers were asked to rate their perceived knowledge of risk factors associated with falls that were addressed in the DVD. To establish content validity, the research team and clinical experts generated a pool of items and met to select the 10 items that best represented the construct. The response options for the items on the scale ranged from 0 (very low) to 10 (very high). This scale had high internal consistency for patients and caregivers (Cronbach alpha was 0.93 at baseline and 0.95 at the three-month survey for both patients and caregivers). The authors calculated a mean item score; higher scores indicated greater awareness of fall risks.

Using similar procedures, the authors also developed a 10-item **Fall Prevention Knowledge Survey** that tested knowledge of fall-prevention strategies that were specifically covered in the DVD program developed for this study. Each item had only one correct response; nine of the items had a list of three to four response options, and one item used a true/false response option. Scores on the Fall Prevention Knowledge Survey could range from 0–10, with higher scores indicating greater knowledge. A reliability measure was not conducted.

At the three-month follow-up survey, patients and caregivers also completed a checklist to note which of 15 potential home modifications they made to reduce fall risk after enrolling in the study; scores could range from 0–15, with higher scores indicating a greater number of home modifications.

Procedures

The *Moving Safely in the Home* DVD program was designed to educate patients with cancer and their family caregivers on safe transfer and ambulation skills as well as approaches for making the home environment safe. The program was unique in its focus on presenting

Knowledge Translation

Involving dyads in fall-prevention skills training has potential for reducing falls among community-dwelling patients with cancer.

Educational delivery via DVD improves knowledge retention.

The Transactional Model of Cancer Family Caregiving Skill is an effective model for the development of caregiving skills training programs.

hands-on nursing skills and the conceptual framework used for content development. The Transactional Model of Cancer Family Caregiving Skill (Schumacher et al., 2006) is a conceptual model that explains the dyadic relationship between patients with cancer and family members and the demands they manage as they partner together in caregiving. The model is intended to promote development of skill-building intervention research in clinical trials.

Eligible patient and family caregiver dyads were randomly assigned to one of two study groups. Participants in the control group viewed the hospital's standard fall-prevention video available on the hospital's patient TV system (viewing time approximately 15 minutes) and received the standard informational flier called *Safety Tips for Preventing Falls in the Home*. Participants in the treatment group received standard fall-prevention education and each patient and family caregiver received a copy of the DVD program. The dyads were instructed to view the DVD program (alone or together—their choice) during the week following patient discharge and at any additional time, based on their needs.

Both groups were followed from the patient's discharge from the hospital to three months postdischarge. Dyads in both groups completed a baseline assessment that included demographic forms, the Fall Prevention Knowledge Survey, and the FRAQ (Wiens et al., 2006). Copies of follow-up surveys were given to participants, who were instructed to mail them back at one week, one month, and three months after study enrollment. Each packet of follow-up interviews was labeled with a due date, and a research assistant made reminder calls to participants to complete and return their surveys. Patients in both study groups also received a fall calendar to record the date of any fall occurrence, the nature of the fall, and any fall-related injury that occurred during the three-month study period. For the purpose of the current study, a fall was defined as an unplanned descent to the floor, ground, or lower level with or without injury (Spoelstra, Given, von Eye, & Given, 2010).

Just before the three-month follow-up surveys were due, a research assistant telephoned all dyads to remind

them to complete and mail back their fall calendars and to ask patients if they had received home health care during the study period. All dyads received a gift card for their participation in the study.

Data Analysis

Patient calendar data and self-reports for the number of home modifications made after study entry were collected at the three-month follow-up only. The distributions for these variables were not normal, so each was analyzed using the nonparametric Mann-Whitney U test. For variables that were assessed multiple times (FRAQ, Perceived Fall Risk Scale, and Fall Prevention Knowledge Survey), data from all four assessments were included in generalized estimation equations (GEE) with study condition and time as factors. The chi-square test was used to analyze categorical data. All analyses were conducted using SPSS®, version 19. A p value of 0.05 or less was considered statistically significant.

Findings

Of the 132 patient and caregiver dyads enrolled in the study, 77 dyads (58%) provided data at the three-month follow-up. Data on the characteristics of the 77 patient and caregiver dyads are presented in Table 1. Participants in the study were primarily female (53%) with an average age of 58.4 years. Most patients were White (84%), well-educated (68% had been to college), and were retired (34%) or disabled (31%). The most frequent cancer diagnoses were leukemia (22%), multiple myeloma (21%), endometrial (16%), and lymphoma (15%); most patients (69%) had cancer that was not staged. Patients were diagnosed with cancer an average of 17.8 months (SD = 33.5 months) before study enroll-

ment. Only 25% of patients reported unlimited mobility, whereas 30% used a cane, walker, or wheelchair. Sixty-four percent reported falling at least once in the three months prior to enrolling in the study.

Sixty-nine percent of caregivers were female and most were White (88%), with an average age of 54.6 years. Caregivers also were well-educated (64% had been to college) and more caregivers were working full-time than were retired (38% versus 31%). Most caregivers lived with patients (78%) and identified themselves as a spouse or partner (60%).

Seventy-seven patients (58%) completed the fall calendar at the three-month follow-up. Patients in the control group turned in calendars at a somewhat higher rate than patients in the treatment group (67% versus 50%), a difference that was largely from a higher number of deaths in the treatment group (18% of patients in the treatment group died versus 8% in the control group). No statistically significant differences were noted between patients or caregivers who completed the study and patients or caregivers who did not complete the final survey on any measured variable. At three months, 94% of patients and 95% of caregivers in the intervention group reported that they had watched the DVD.

No difference was noted in the number of times patients reported falling in the three months prior to study enrollment between the treatment and control groups ($\bar{X} = 0.59$, $SD = 1.16$ versus $\bar{X} = 0.83$, $SD = 1.24$ [$U = 591$, $p = 0.187$]), respectively. Similarly, no difference was noted in the percentage of patients who reported falling at least once (27% versus 44%) for the treatment and control groups, respectively ($\chi^2 [1] = 2.45$, $p = 0.15$). Because randomization successfully produced groups of equivalent fall risk, the authors ran post-test-only analyses of calendar accounts of falls without using self-reported falls prior to baseline as a covariate.

Although the treatment group reported fewer number of falls than the control group in the three-month reports (see Table 2), the difference did not reach statistical significance ($U = 613$, $p = 0.14$). However, patients in the treatment group were significantly more likely to report not falling at all in the three-month follow-up period than patients in the control group ($\chi^2 [1] = 3.9$, $p < 0.05$). Patients in the treatment group also were less likely to report a fall with an injury than patients in the control group, but the difference didn't reach statistical significance ($\chi^2 [1] = 3.51$, $p < 0.06$). Patients in the treatment group reported making more home modifications than patients in the control group ($U = 491$, $p < 0.05$), but caregivers in both groups

Table 2. Falls and Home Modifications by Group at the Three-Month Follow-Up

Patients	All (N = 77)		Treatment (n = 34)		Control (n = 43)		p
	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	
Number of falls	0.47	0.79	0.29	0.58	0.6	0.9	0.14
Home modifications	3.9	2.9	4.5	2.6	3.4	3.1	0.03
Patients	n		n		n		p
At least one fall	25		7		18		0.04
Any fall with injury	11		2		9		0.06
Caregivers	All (N = 75)		Treatment (n = 33)		Control (n = 44)		p
	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	
Home modifications	4.6	3.3	4.3	3.1	4.9	3.5	0.4

Table 3. Scores for Outcomes Measured at Four Time Points

Patient Measure	Baseline				1 Week				1 Month				3 Months				Cond x Time	p	
	Treatment (n = 34)		Control (n = 42)		Treatment (n = 34)		Control (n = 42)		Treatment (n = 31)		Control (n = 42)		Treatment (n = 34)		Control (n = 43)				
	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD			
FRAQ Total Score	32.9	3.7	33	4.7	34	4.2	34.1	3.8	34.1	4.7	33.7	3.7	33.7	4.5	34.9	3.4	0.73	0.13	0.49
Perceived Fall Risk Scale	5.7	2.2	5.1	2	7.9	1.8	6.7	1.9	8.2	1.5	6.8	2.2	8.2	1.7	7.1	2.2	0.01	0.01	0.47
Fall Prevention Knowledge	6.6	1.4	6.7	1.3	7.2	1.4	7.1	1.2	7.5	1.2	6.9	1.3	7.8	1.1	6.9	1.2	0.08	0.01	0.01
Caregiver Measure	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	Cond	Time	p
FRAQ Total Score	33.5	3.4	33.2	4.6	35.4	4.1	34	4.1	34.8	3.9	34	3.8	35	3.3	34.5	3.6	0.27	0.02	0.51
Perceived Fall Risk Scale	5.4	2.1	5.1	2.2	7.8	1.8	6.6	2.1	8.2	1.3	7.2	1.8	8.8	0.9	7.8	1.7	0.01	0.01	0.2
Fall Prevention Knowledge	7.1	1.2	7.3	1.6	7.9	1.1	7.2	1.5	7.7	1.1	7.2	1.3	7.9	1.1	7	1.7	0.04	0.13	0.01

Cond—treatment condition effect; Cond x Time—interaction effect between treatment condition and the time of assessment; FRAQ—Fall Risk Awareness Questionnaire
 Note. Scores on the FRAQ range from 0–49, with higher scores indicating greater awareness of fall risks. Scores on the Perceived Fall Risk Scale range from 0 (very low) to 10 (very high).
 Scores on the Fall Prevention Knowledge survey range from 0–10, with higher scores indicating greater knowledge.

reported making a similar number of home modifications. The top four types of home modifications reported by patients included decluttering floors (62%), securing loose cords and cables (47%), removing and securing throw rugs (42%), and improving poor lighting (41%). Caregivers reported decluttering floors (76%), removing and securing throw rugs (60%), removing obstacles from hallways (54%), and securing loose cords and cables (51%).

Patients in both groups improved across time on the Perceived Fall Risk Scale (Wald χ^2 [3] = 75.05, $p < 0.01$) (see Table 3), but the treatment group scored higher overall than the control group (Wald χ^2 [1] = 11.27, $p < 0.01$). In addition, all patients improved on Fall Prevention Knowledge Survey (Wald χ^2 [3] = 17.11, $p < 0.01$), but patients in the treatment group showed greater improvement over time (Wald χ^2 [3] = 13.32, $p < 0.01$). No differences were noted in FRAQ scores between study groups, and scores did not change significantly over time.

Caregivers in both groups improved over time on the Perceived Fall Risk Scale (Wald χ^2 [3] = 196.8, $p < 0.01$), but the treatment group scored higher overall than the control group (Wald χ^2 [1] = 6.92, $p < 0.01$). For the Fall Prevention Knowledge Survey, caregivers in the treatment group scored higher overall (Wald χ^2 [1] = 4.14, $p < 0.01$) and across time (Wald χ^2 [3] = 12.05, $p < 0.01$). Caregivers scored higher on the FRAQ across time (Wald χ^2 [3] = 10.06, $p < 0.01$), but no other effects were statistically significant.

Discussion

Fall-prevention initiatives have not typically targeted the family caregiver, who frequently is responsible for the day-to-day care of a family member with cancer who is at risk for falling. In a study exploring the impact of falling on frail older adults and family caregivers, researchers recommended that fall-prevention programs should include dyads of patients and caregivers because caregivers are highly involved in daily care activity and also suffer from the fear and anxiety of a loved one possibly falling (Faes et al., 2010). Involving dyads in skills training, such as safe mobility, is essential because of the interdependent

relationship described in Schumacher et al.'s (2006) transactional model. The current study found that 78% of caregivers lived with patients, and 46% perceived being committed to family caregiving full-time. The family caregiver is an invaluable resource, embedded within the day-to-day activities of the patient with cancer.

Only a few studies have examined family involvement in fall-prevention programs in the acute care setting. Ryu, Roche, and Brunton (2009) implemented a fall-prevention program for patients and their family members on a neuroscience unit. Using one-on-one instruction and informational pamphlets, this performance improvement project resulted in no falls occurring in the treatment group.

The current study aimed to have patients and their caregivers view the DVD program and then partner in practicing fall-prevention skills. Results were promising in that patient caregiver dyads in the treatment group who viewed the DVD program were significantly less likely to report having a fall during the three-month follow-up period. A clinically relevant finding was having patient and caregiver dyads who viewed the program experiencing, on average, fewer falls and fall injuries, although results were not statistically significant. The findings suggest that mobility skills training is an educational option worth further testing for reducing fall occurrence. The skills are safe and easy to perform, given the proper instruction.

Nurses should initiate fall-prevention measures early for patients with cancer. Numerous risk factors are associated with falls in patients with cancer that are not associated with the disease itself, including chemotherapy side effects and the use of psychotropic agents. Spoelstra et al. (2013) argued the need for implementing assessment and fall-prevention interventions early, particularly for older adults at the time of cancer diagnosis. A program such as the DVD tested in this study offers an excellent educational resource to make available to patients and family caregivers that can be accessed 24/7.

The DVD program *Moving Safely in the Home* was designed to educate learners about fall risks and to offer clear step-by-step techniques for how to safely ambulate and transfer patients in the home. Patients and caregivers who viewed the DVD reported a significant improvement in fall knowledge and fall risk awareness over time, suggesting that the educational delivery approach using a DVD may support knowledge retention. In addition, patients who viewed the DVD reported making more home modification changes than those in the control group, whereas caregivers in both groups made home modifications. Patients' and caregivers' ability and awareness of the need to make the home setting safer helps position them to better anticipate and manage barriers to mobility and prevent falls.

Limitations

The main limitation of this study was the attrition rate. Many patients and caregivers indicated that they were unable to complete the study because of demands of the illness (e.g., feeling fatigued, being rehospitalized). Although the researchers attempted to reduce attrition by excluding patients with stage IV cancers, 69% of those enrolled in the study either had unstaged cancer (e.g., leukemia, lymphoma) or they were not aware of the stage of their disease. Patients in this study were seriously ill. Of the 26 patients who reported falling during the three-month study, only three were stage I–III.

These high-risk patients would benefit from their caregivers being familiarized with fall-prevention strategies. Although the authors did not find any differences in baseline characteristics between those who did and did not complete the study, unmeasured factors may account for the differences between study groups.

The authors also did not have sufficient data regarding how caregivers and patients used the information in the DVD. The findings relied on self-reports that the DVD was viewed. The authors did not have direct observational data on viewing habits and were not able to conduct interviews to find out how patients and caregivers used the DVD or the information in the DVD to prevent falls.

Implications for Nursing Research and Practice

The literature provides no evidence of formal fall-prevention education programs involving family caregivers or specifically targeted patients with cancer. In a systematic review, Gillespie et al. (2009) gave no mention of family caregivers or fall-prevention skills training as tested approaches for fall prevention. Typically, fall-prevention strategies (e.g., exercise, medication regimen revisions, vision assessment) have targeted patients only. However, in this same review of studies, home safety assessment and modification interventions (an integral part of this tested DVD program) were effective in reducing the rate of falls and risk of falling.

Nurses should focus efforts at improving the knowledge and skills of family caregivers in being able to recognize patient fall risks, make adjustments within the home environment, and be able to perform mobility skills (such as transfer techniques and ambulatory assistance) competently. This study relied on an educational approach for fall prevention only, although it was innovative in its focus on skills training. Previous research trials testing interventions to increase knowledge of patients about fall prevention alone did not significantly reduce the rate of falls or risk of falling

(Gillespie et al., 2009). Future research should incorporate a process for validating skills acquisition by patients and caregivers through the conduct of home visits. In addition, because cancer is a chronic disease, the incorporation of ongoing coaching (such as motivational interviewing) of dyads may prove beneficial to enhance patient and caregiver adherence to fall-prevention approaches.

Conclusions

This study offered an innovative approach in preparing patients and family caregivers with the fall-prevention skills and knowledge necessary to intervene early and create a safe mobility environment within the home. The ability to perform caregiving skills safely and effectively is crucial for improving patient self-care outcomes. The authors believe that opportunities exist to improve patient and caregiver outcomes through

training in a variety of other caregiving skills using the Transactional Model of Family Caregiving Skill as a conceptual framework. A copy of the DVD *Moving Safely in the Home* is available through request to the primary author.

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