Tailoring Education to Perceived Fall Risk in Hospitalized Patients With Cancer: A Randomized, Controlled Trial

Megan L. Kuhlenschmidt, BSN, RN, OCN®, Christina Reeber, BSN, RN, OCN®, Christine Wallace, MSN, RN, ACNS-BC, PCCN, Yanwen Chen, PhD, MS, Jill Barnholtz-Sloan, PhD, and Susan R. Mazanec, PhD, RN, AOCN®

Background: Patients with cancer carry a higher risk for falls, potentially resulting in increased morbidity, mortality, and financial costs, as well as lower quality of life. Few evidence-based interventions are tailored to the patient’s perception of risk for falls.

Objectives: This study aimed to determine the effect of tailored, nurse-delivered interventions as compared to a control group on patient perception of risk for falls, confidence in fall prevention, and willingness to ask for assistance.

Methods: A two-group, prospective, randomized, controlled design was used to test the intervention in a convenience sample of 91 patients on an adult bone marrow transplantation unit. The intervention consisted of video and printed education tailored to the nurse’s risk assessment and the patient’s perception of risk. Patient’s self-reported perception, confidence, and willingness were measured at three time points: after consent within 24 hours of admission and at 24 and 72 hours after consent. The analysis consisted of a paired McNemar’s test stratified by intervention versus control group to examine differences between the groups.

Findings: About one-third of patients perceived themselves to be at low risk for falls despite a nurse rating of high risk. A statistically significant difference existed in the proportion of patients who perceived themselves to be at high risk for falls pre- and postintervention (p = 0.01). Results suggest that tailoring education to the patients’ perceived risk for falls can help patients become more aware of fall risk.

Key words: cancer; fall prevention; hospitalized falls; falls intervention

Digital Object Identifier: 10.1188/16.CJON.84-89

Falls in hospitalized patients are associated with poorer quality of life, greater disability, longer hospital stay, increased resource use, and greater risk of institutionalization (Hill et al., 2009). Falls are devastating to patients, family members, providers, and the healthcare system, with 34% of falls leading to injury (Fisher, Davis, McLean, & Le Couteur, 2005). Falls are defined as an unplanned descent to the floor that results from physiologic or environmental reasons and may occur with or without injury (Press Ganey Associates, Inc., 2015). The national average is 3.34 falls per 1,000 patient care days (Press Ganey Associates, Inc., 2015). During the past year, the falls rate on the inpatient bone marrow transplantation unit at the Seidman Cancer Center of University Hospitals Case Medical Center in Cleveland, Ohio, was an average of 3.2 per 1,000 patient care days. Of particular concern was that 8 of the 24 falls on the bone marrow transplantation unit in 2013 led to injury, which required additional treatment.
Patients with cancer have several unique risks for falls and injuries in addition to general fall risk factors, which include neurologic and nutritional deficits related to cancer treatment, polypharmacy, and deconditioning from cancer-related fatigue (Capone, Albert, Bena, & Tang, 2012). Advanced age has also been associated with increased falls in oncology populations (O’Connell, Cockayne, Wellman, & Baker, 2005). Older adults often have an overly positive perception of their state of health in general and may underestimate their risk of falls (Hughes et al., 2008). Hospitalized adults with cancer are at an additional risk for falls because of factors unique to oncology populations (Wildes et al., 2014). Although not all falls are serious enough to require intervention, they may still lead to increased fear of another fall. This fear may restrict a patient’s activities of daily living (Verheyden et al., 2013).

Primary sequelae of a fall include injury and postfall anxiety, with subsequent loss of independence through disability and fear of falling (Chang et al., 2004). Oncology treatments are often given during long hospital stays, and patients may feel a loss of control because of the extended length of treatments. Patients with cancer are at risk for rapidly changing health status and, therefore, need a different kind of falls surveillance than those in other inpatient care units (Filler, Kelly, & Lyon, 2011). Early intervention with patients with cancer at high risk for sustaining a fall is critical to prevent falls and injury.

The substantial research of risk factors associated with falls in hospitalized patients has increased awareness that falls are multifactorial in nature and associated with multiple medical, functional, and cognitive factors (Tzeng, Hu, Yin, & Johnson, 2010). One area that has not been studied in depth is hospitalized patients’ perceptions of their risk of falling and sustaining an injury. A personal history of a previous fall was associated with greater awareness of fall risks in a survey study of 120 community-dwelling adults (Wiens, Koleba, Jones, & Feeny, 2006). Perceived risk is of particular concern in an oncology population because patients come to the inpatient setting in good health or may present with a new diagnosis, but they often believe that they are healthy and fit. They may not perceive that they are at an increased risk to have a fall.

An integral component of primary prevention of falls is an evaluation of patient and caregiver awareness of the risk factors for falls (Sadowski, Jones, Gordon, & Feeny, 2007). Nurses have a unique body of knowledge and awareness of risk factors for patient falls and of falls that may cause injury. In addition, they have knowledge of the effectiveness of related interventions in inpatient care settings (Tzeng & Yin, 2012). However, nurses’ perceptions about the most frequent and preventable risk factors for injurious falls, as well as the most frequently adopted and most effective interventions, were found to be variable in a study of hospitalized patients (Tzeng & Yin, 2012). Patient education will likely be less effective if nurses’ perceptions of fall risk are inconsistent with those of patients.

While patients are in the inpatient setting, nurses play a vital role in educating them about fall prevention. Accurate assessment about patient awareness of risk for falls is an important building block in any fall-prevention program or campaign (Wiens et al., 2006). Substantial evidence supports the effectiveness of multistategy programs to reduce fall rates. However, the specific contributions of patient education and the impact of tailored messages are less researched (Hughes et al., 2008). A systematic review and meta-analysis of interventions for preventing falls and fall-related injuries among older adults found that multifactorial interventions, which require an individually tailored approach, can reduce falls (Goodwin et al., 2014). The ineffectiveness of an intervention to alter patients’ perceived risk for falls may reflect a failure to personalize the message in terms of individual risk (Hughes et al., 2008). Sadowski et al. (2007) suggested that one strategy for fall prevention may be for health professionals to assess a patient’s knowledge of the risk factors for falling routinely and then provide education in deficit areas. One trial tested an educational session in 1,822 older adults residing in nursing homes to target known risk factors, such as age, mobility status, and altered elimination (Ang, Mor-diffi, & Wong, 2011). In high-risk individuals, this educational session significantly reduced the risk of falling. This finding suggests that education tailored to the patient’s specific risk factors might also reduce patient falls in the hospital setting.

Patient education that is tailored to patient’s perceived risk is consistent with the Health Belief Model (HBM) developed by Rosenstock (1974). According to the HBM, perception of a threat, as well as perceived benefits, barriers, and self-efficacy, is directly related to behavior change. Therefore, a perception of higher risk of sustaining a fall would likely lead to greater engagement in preventive activities. However, most intervention studies are targeted to exercise, use of medications, and environmental adaptation (Verheyden et al., 2013). To the authors’ knowledge, no studies of interventions that are tailored to the patient’s perception of fall risk exist.

The primary objective of this study was to determine the effect of a tailored, nurse-delivered intervention, as compared to a control group, on perceived risk for falls, confidence to prevent falls, and willingness to ask for assistance in hospitalized hematology/oncology patients. Secondary objectives were to describe the relationship between patients’ perceived risk for falling and (a) their willingness to ask for assistance with ambulation, (b) performance of nursing risk assessments, (c) incidence of sustaining a fall, and (d) patient satisfaction with the intervention.

**Methods**

**Design, Setting, and Sample**

A two-group, prospective, randomized, controlled design was used to test the intervention in a convenience sample of 91 patients on an adult bone marrow transplantation unit.

Inclusion criteria for patients were a cancer diagnosis; admission to the inpatient bone marrow transplantation unit; being alert and oriented to person, place, and time; and ability to speak English. Patients were excluded if they were actively dying or had a physician order for bed rest. Eligibility was not affected by any treatments or chemotherapy regimens that the patient was receiving. After approval from the institutional review board at University Hospitals Case Medical Center, patients were identified from the admission log kept by the division secretary. They were screened for eligibility via questions directed to the nurse caring for the patient. Patients were then approached, and written informed consent was obtained.
Based on clinical experience, the baseline proportion of individuals at high risk for falls at the cancer center was estimated to be 50%. Sample size was determined based on an initial hypothesis that 30% or more of the low-perception category would change to the high-perception category postintervention. Based on these proportions, at a 0.05 significance level with 80% power, 88 individuals, with 44 in the intervention group and 44 controls, were needed for the study. With an estimated 5% dropout rate, the final projected sample size was 91 patients.

Measures

The 15 education sheets and 4 videos were developed by the principal investigator. Content of the videos was determined by clinical practice guidelines and the literature. The content was validated by a team of clinical experts. The 15 education sheets addressed different topics, such as frequent toileting, sedating medications, and history of having a fall. Patient-specific risk factors for falls, ways to decrease the risk, and how the patient could work with the healthcare team to remain safe from a fall were included in the information sheets.

Four videos were created with tailored messages for falls risk categories: (a) high perception of a fall by the patient or high risk for a fall as assessed by the nurse, (b) low perception of a fall by the patient or high risk for a fall as assessed by the nurse, (c) high perception of a fall by the patient or low risk for a fall as assessed by the nurse, and (d) low perception of a fall by the patient or low risk for a fall as assessed by the nurse. All videos were in English. For example, the videos for the patient with a high risk of falling included direct language and pertinent topics, such as fear of having a fall.

The patients completed an investigator-constructed perceived risk survey that consisted of two sections. First, patients rated their perceived risk for falls, their confidence to prevent a fall, and their willingness to ask for assistance on an eight-point Likert-type scale ranging from 0–7. A rating of 4 or greater on the perceived risk for falls scale indicated a high risk for having a fall. Second, patients completed a knowledge assessment of 15 risk factors rating their likelihood of each risk factor causing a fall on a four-point agreement scale from strongly agree to strongly disagree. The topics were related to known risk factors and included lack of activity, pain medications, sleeping medications, water pills, chemotherapy, anti-anxiety or antidepressant medications, heart medications, changes in blood counts, getting up to use the bathroom frequently, having to use the bathroom quickly, changes in weight (either gain or loss), past falls, being in an unfamiliar location, and fear of falling.

The perceived risk survey content was reviewed by a team of clinicians with expertise in falls. Patients with a score of 4 or higher on the perceived risk for having a fall question were assigned to the high-risk group.

Demographic data included age, gender, race, ethnicity, household income, and highest level of education completed. Medical data included diagnosis, reason for admission to the cancer center, length of stay, and a history of previous falls. The functional status was assessed using the Eastern Cooperative Oncology Group (ECOG) Performance Status Scale (Oken et al., 1982).

Patients rated their satisfaction with the education on an eight-point Likert-type scale, with 0 indicating being not at all satisfied and 7 indicating being satisfied. They also noted whether they read the information sheets. The research nurse provided the tailored education sheets to the patient and briefly discussed the content. The nurse’s perception of the patients’ fall risk was measured using the standardized hospital fall assessment tool used in clinical practice via the electronic medical record.

Study Procedures

Data were collected from February to September 2014 and occurred at three time points: after consent within 24 hours of admission and at 24 and 72 hours after consent. At baseline, patients completed the perceived risk survey and the demographic survey. The intervention was delivered immediately after consent was obtained. Simultaneously, the research nurse completed the hospital fall assessment tool and the nurse fall risk assessment. Based on the patient and nurse assessments, patients were placed in one of four fall risk categories: (a) high perception of a fall by the patient or high risk for a fall as assessed by the nurse, (b) low perception of a fall by the patient or high risk for a fall as assessed by the nurse, (c) high perception of a fall by the patient or low risk for a fall as assessed by the nurse, or (d) low perception of a fall by the patient or low risk for a fall as assessed by the nurse. Patients were then randomized to the intervention or the control group. Both groups received usual care, including the hospital fall risk assessment that is completed every eight hours. All patients then completed the perceived risk surveys and satisfaction survey at 24 and 72 hours after consent was obtained.

Intervention Procedure

The intervention group received individual education based on the risk category as determined by the nurse’s assessment and the patient’s perception of risk. The intervention was delivered on admission to patients with an oncology diagnosis regardless of their current treatment status (e.g., cycle of chemotherapy, pre- or post-transplantation). It consisted of three components: (a) an investigator-developed video, which was created for the specific risk group, (b) printed education sheets targeted to patients’ misconceptions about their fall risk, and (c) discussion with the research nurse. The sessions were delivered by direct care nurses who had completed an online course in human participant protection (referred to as research nurses). For all patients, the video included discussion on (a) the definition of fall risk, (b) patient’s risk for a fall, (c) patient’s risk for injury, (d) how nurses can help, and (e) fear of falling.
For patients at high risk for a fall, the video included a statement about being at risk, information about bed alarms, and instruction to always call for assistance. The length of the intervention and assessment was about 15 minutes. To maintain consistency of the intervention, a small team of four direct care nurses, who had completed an online human participant protection course, delivered the intervention. These nurses were trained by the investigator and were required to demonstrate the consent process, intervention, and data collection to the investigator.

Control Group Procedure

The control group received the standard education, which consisted of the hospital patient education sheet and assessment with the standardized hospital assessment tool. This sheet was given to patients after they completed the survey, and they had a brief opportunity to ask questions. They were instructed to follow up with the nurse caring for them if they had further questions.

Data Analysis

The demographic comparison between the intervention group and the control group was conducted by using Wilcoxon, chi-square, and Fisher’s exact tests. The analysis consisted of a paired McNemar’s test to examine differences in proportions between the groups. All statistical analyses were performed using SAS®, version 9.4, or R, version 3.1.1.

Results

Of the 135 patients screened for eligibility, 44 patients declined to participate in the study for the following reasons: because they were not interested (n = 20), overwhelmed (n = 6), or too sick or weak (n = 18) (see Table 1). The mean age was 58.79 years (SD = 14.25). The majority of patients were Caucasian, and the mean ECOG score was 2.33. Of the 91 patients, 20 reported a previous fall. The most common fall risk category at enrollment was the low perception and low risk group; however, about one-third of patients perceived themselves to be at low risk for falls despite an assessment of high risk by the nurse. No statistically significant differences existed between the control and intervention groups on any demographic variables, history of falls, or group assignment. No patients dropped out after consent.

The primary research objective was to determine the effect of a tailored, nurse-delivered intervention, as compared to the control group, on perceived risk for falls in hospitalized hematology/oncology patients. As shown in Table 2, a statistically significant difference was found in the proportion of patients who perceived themselves to be at high risk for falls despite perceiving themselves as low risk prior to the intervention (p = 0.01). No significant changes were found in confidence or willingness to ask for assistance in the intervention group. No significant changes were found in perception, confidence, or willingness in the control group over time.

The most commonly used education sheet of fall risk factors was water or diuretic pills, followed by heart medications and antianxiety and antidepressant medications. Another secondary objective was to assess actual falls in both groups. Two patients in the control group fell, but no patients in the intervention group fell. Both patients in the control group had rated themselves as low perception of risk, and one was rated a high fall risk during the nurse’s assessment.

Satisfaction with the intervention was measured at 24 and 72 hours postintervention. The average satisfaction rating was 6 on an eight-point Likert-type scale with 0 being not at all satisfied and 7 being satisfied.

Discussion

This study helps to further develop previous research related to tailoring fall prevention interventions. The intervention, tailored verbal and written patient education, was effective in increasing perceived risk. Oncology nurses performing fall risk assessments must incorporate a structured evaluation of patient perception of their risk factors. Research has shown that an effective fall intervention involves assessing an individual’s fall risk factors (Stevens & Phelan, 2013). This would allow for an educational approach that is tailored to risk perception for the patient and nurse, as well as actual risk factors.

Of note, only a small amount of the enrolled patients believed that they were at a high risk for a fall. The nurse assessment, however, rated about half of the enrolled patients as a high risk for a fall. High-risk criteria included specific medications, fluid status, previous falls, unsteady gait, inability to follow
TABLE 2. Changes in Risk Perception Over Time (N = 91)

<table>
<thead>
<tr>
<th>Time</th>
<th>Low Perception</th>
<th>High Perception</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>40</td>
<td>7</td>
<td>0.1</td>
</tr>
<tr>
<td>T2</td>
<td>37</td>
<td>10</td>
<td>0.1</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>40</td>
<td>7</td>
<td>0.06</td>
</tr>
<tr>
<td>T2</td>
<td>37</td>
<td>13</td>
<td>0.06</td>
</tr>
<tr>
<td>T3</td>
<td>35</td>
<td>12</td>
<td>0.06</td>
</tr>
<tr>
<td>Intervention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>37</td>
<td>7</td>
<td>0.01</td>
</tr>
<tr>
<td>T2</td>
<td>31</td>
<td>13</td>
<td>0.01</td>
</tr>
<tr>
<td>T3</td>
<td>28</td>
<td>16</td>
<td>0.01</td>
</tr>
</tbody>
</table>

T1—at consent within 24 hours of admission; T2—24 hours after consent; T3—72 hours after consent

Implications for Nursing and Conclusion

Fall prevention is best approached from a patient-centered perspective. The routine nursing fall risk assessment should be conducted at the bedside with patient involvement. Patients, as members of the care team, must be included in the determination of fall risk, including structured assessment of patients' perceived risk and knowledge of risk factors. Involvement of patients in the screening process raises awareness of fall risk and guides the nurse to more effectively tailor patient education. This approach should be supplemented with fall prevention education materials specific to the patient population. Additional credible resources for preventing falls in hospitalized patients with cancer can be found at the Agency for Healthcare Research and Quality (www.ahrq.gov) and the U.S. Department of Veterans Affairs National Center for Patient Safety (www.patientsafety.va.gov).

Additional research should include psychometric testing of the investigator-developed tools for measuring perception, willingness, and confidence. The intervention could also be tested during a longer time period during extended hospitalizations. Because the educational sheets and the video were used in this intervention, separating the components of the intervention for additional testing and development would be helpful.

References


Directions and other known risk factors. This demonstrates a critical need for assessment tools and interventions to realign discrepancy in perceptions of fall risk between nurses and patients. The knowledge assessment, filled out prior to randomization, and education sheets that the intervention group received were targeted to these discrepancies and easily administered. The evidence in the literature also suggests that programs tailored to the education needs of high-risk patient populations have more impact on fall incidence than general programs (Lloyd, 2011).

A low percentage of actual falls occurred in this study (n = 2), making it difficult to identify significant differences between the control and intervention groups. The finding that patients with low perception fell, whether high or low risk, suggests that the intervention could be applicable across risk groups.

The finding that the intervention was not effective in changing willingness to call for assistance is likely because of the high percentage of participants in both groups that rated themselves as having a high willingness to ask for assistance. This is not consistent with what is often observed in clinical practice.

This assessment and intervention was feasible for the bedside nurse to complete on a busy unit. Patients enrolled in the study were willing and eager to discuss fall risk and their past experiences.

Limitations

A limitation to the study was the use of a convenience sample. Data were collected at one site, an adult bone marrow transplantation unit, and may not be generalizable to other cancer centers. The tools to measure perceived risk, confidence, and willingness to ask for assistance were investigator-developed and consisted of only a single item, limiting the scope of the assessment. A phenomenon that occurred during this study was that patients gained an awareness of fall risk from the consent process and initial discussion with the research nurse. This unintentional consequence made it difficult to measure the true magnitude of the effect of the interventions.


