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An Analysis of Falls Experienced by Older Adult Patients Diagnosed With Cancer

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Falls are the leading cause of injury-related deaths in the United States for people aged 65 years and older (Centers for Disease Control and Prevention [CDC], 2006). Approximately 33% of people aged 65 years and older have experienced a fall (Hausdorff, Rios, & Edelberg, 2001), about \$19 billion are spent per year on fall-related treatment in the United States (Stevens, Corso, Finkelstein, & Miller, 2006), and about 16,000 people aged 65 years and older die per year as a result of injuries from a fall (CDC, 2008). A diagnosis of cancer and cancer treatment can cause vulnerability in older populations, and falls are one factor that can lead to an increased level of health-related vulnerability that can potentially delay cancer treatment, threaten independence, and compromise quality of life in patients who are undergoing treatment for malignancy.

The purpose of this prospective, exploratory, qualitative research was to provide information on issues concerning falls, particularly to patients with cancer, and to examine similarities in the data that may eventually lead to enhanced nursing care of older adults. Themes depicted in transcripts of structured interviews will be developed into future research aimed at reducing injuries associated with falls in patients with cancer who have fallen or are deemed at risk for falling.

Research Questions

In addition to descriptive information concerning age, cancer diagnosis, cancer treatment, performance status, fall risk factors, and location of falls, several questions were addressed in this preliminary study: (a) What themes were identified as activities reported to cause falls? (b) What themes were associated with self-imposed interventions as a result of the falls? and (c) What themes were identified as limitations contributing to falls?

Purpose/Objectives: To examine themes associated with falls specific to older adult patients diagnosed with cancer.

Design: Prospective, exploratory, qualitative study.

Setting: A senior adult oncology program at a cancer and research center in the southeastern United States.

Sample: Men and women aged 70 years and older with any cancer diagnosis who had experienced a fall within three months.

Methods: Patients were telephoned after research consent to participate in an interview about their falls. Frequencies were conducted on the biographic data. Themes were identified and grouped according to topic.

Main Research Variables: Eastern Cooperative Oncology Group performance status, cancer site, cancer treatment modality, location of fall, and fear of falls.

Findings: Mean age was 76.2 years. Most falls occurred at home (75%). The themes of physical problems, general weakness, and walking were found to be the most common motivations for falls. Themes associated with self-imposed activities as a result of falls included "being more careful" and "using an assistive device."

Conclusions: Perceptions of physical problems, general weakness, and difficulty walking should be included in an oncology nursing fall-risk assessment. Exploration of perceptions concerning activities that have potentially caused a past fall and self-imposed activities also should be included.

Implications for Nursing: Beyond the boundaries of a fall-risk assessment, conducting a subjective interview to identify the individualities of falls and fall risk is vital to constructing a realistic plan of care.

Significance

Cancer treatment with chemotherapy can increase the rate of reported falls (Overcash & Beckstead, 2008). Older adults diagnosed with cancer but not receiving chemotherapy reported a rate of falls at 21% compared to 32% in the same population who were undergoing

chemotherapy (Overcash & Beckstead, 2008). Injuries such as hip fractures and head traumas occur in 20%–30% of people who fall (Sterling, O'Connor, & Bonadies, 2001). Risks for falling have been associated with a history of falls (American Geriatrics Society [AGS], 2001), fear of falling (Tinetti, Mendes de Leon, Doucette, & Baker, 1994), poor balance (Aslan, Cavlak, Yagci, & Akdag, 2007), and emotional concerns such as depression (Turcu et al., 2004). Older adults diagnosed with cancer and undergoing treatment with chemotherapy may have particular issues that can cause a fall such as fatigue, physical weakness, insomnia, and functional status issues (Holley, 2002). A diagnosis of cancer often is one of several comorbid conditions for which an older adult may be treated and effects from chemotherapy may coexist with other medical treatments to culminate in weakness leading to falls. Living alone without a caregiver also may put older patients with cancer at risk for falls in performing tasks that require more robust physical independence such as housekeeping, shopping, and cooking while weak or fatigued from chemotherapy.

Background

Falls Specific to Patients With Cancer

Not a great deal of research exists on falls specific to patients with cancer. Prostate cancer is a rather common malignancy with 203,415 men diagnosed in the United States in 2006 (CDC, 2010). Many of those diagnosed will receive treatment with cancer therapies such as androgen deprivation therapy, which has been found to contribute to functional and physical impairments that can enhance the risk of falling (Bylow et al., 2008) and also may contribute to frailty (Bylow, Mohile, Stadler, & Dale, 2007). Long-term treatment with androgen deprivation therapy has been found to lower bone mineral density, create upper body weakness, and reduce quality of life (Basaria et al., 2002), all of which can contribute to falls.

For some cancers, fall risk may be more enhanced. In breast cancer, adjuvant endocrine therapy in premenopausal women has been found to cause loss of bone mineral density (Gnant et al., 2008). In postmenopausal women, a diagnosis of breast cancer alone has been found to increase the risk of falls and fractures (Chen et al., 2005, 2008); therefore, assessing falls and fall risk in older, postmenopausal women with breast cancer is important.

Fatigue is a common issue in older patients with breast cancer (Rao & Cohen, 2008) and has been associated with falls (Holley, 2002). Fatigue has been related to changes in gait (Helbostad, Leirfall, Moe-Nilssen, & Sletvold, 2007) that enhance fall risk. Anemia has been directly linked to falls for patients in the nursing home setting (Pandya, Bookhart, Mody, Funk Orsini, & Reardon, 2008), and about 90% of patients with cancer were found to have anemia (Knight, Wade, & Balducci, 2004). In addition,

chemotherapy-related low hemoglobin levels may be reflective of low physiologic reserve (Blair, Bardwell, Podbelewicz-Schuller, & Mortimer, 2008), which increases the risk of falls. Additionally, fatigue has been shown to be a factor involved in functional status limitations (Luciani et al., 2008), which also contribute to fall risk (Overcash, 2007; Overcash & Beckstead, 2008).

About 55% of adults aged 65 years and older engaged in a geriatric oncology program were found to have a functional status limitation (Overcash, 1998). Functional status is the ability of a person to complete basic activities that enable independence. People who have impaired functional status are at risk for a host of issues, such as nursing home placement (Rozzini et al., 2006), falls (Overcash, 2007), hospitalizations (Feldblum et al., 2008), and frailty (Carey et al., 2008; Hoogerduijn, Schuurmans, Duijnste, de Rooij, & Grypdonck, 2007).

Fall Assessment With Clinical Instruments

AGS (2001) offers a guideline for fall prevention. The guideline suggests that fall assessment become part of routine outpatient care and if a fall occurred in the last year should be asked. If a fall has occurred, a Get Up and Go Test (Mathias, Nayak, & Isaacs, 1986) should be administered. For older adults who are considered frail in respect to balance, recurrent falls, and abnormal gait, a fall evaluation should take place that includes a history of events surrounding the falls, medications, comorbid conditions, and other aspects of health events.

Some instruments have been developed to assess fall risk. The St. Thomas's Risk Assessment Tool in Falling Elderly Inpatients (Milisen et al., 2007) was developed to assess fall risk in hospitalized patients. However, when assessed for sensitivity and specificity, it was not shown to predict falls in people aged 75 years or older who were admitted to geriatric inpatient facilities.

The Morse Fall Scale (Morse, Morse, & Tylko, 1989) was developed in the late 1980s and is a commonly used clinical instrument. The scale considers a history of falling, comorbidities, assistive devices for walking, IV therapy, gait, and mental status. Scoring cut points are provided. Of the 113 participants who reported a fall, 75 were scored in the "high risk" category, thus determining validity. Additionally, the scale was shown to be sensitive to change as evidenced by the differences in the daily scores. Inter-rater reliability scores using 21 raters was $R = 0.96$.

The Care Dependency Scale has been shown to be effective in predicting falls in hospitalized patients (Mertens, Halfens, & Dassen, 2007). However, no validity and reliability information has been published in relation to falls. Also, several database-oriented tools have been developed for older inpatients or nursing home residents to predict falls (French et al., 2007; Volrathongchai, Brennan, & Ferris, 2005). The tools were developed to generate

models of fall risk based on physical and psychosocial variables in participants from multiple sites. These tools are not specific to patients with cancer.

The assessment of the occurrence of falls has been shown to be effective using the AGS (2001) fall detection guideline of asking whether a fall has occurred in the past year. If a fall has occurred, several additional measures of assessment are recommended to determine risk. Falls and risk for falls are important considerations in the care of older adult patients. Risk for falls is enhanced because of cancer disease site and potential adverse effects associated with various therapies. Fall assessment should be a critical part of a nurse's patient evaluation system.

Methods

Design, Population, and Sample

This prospective, exploratory, qualitative study was conducted as a pilot project for additional clinical falls research. The sample consisted of outpatients with any diagnosis of cancer who reported a fall within three months and were aged 70 years and older. All patients had to have experienced a fall within three months of the interview. Patients were excluded from the study if they were younger than age 70 and without a diagnosis of cancer. Informed consent was obtained prior to the study telephone interview. The Senior Adult Oncology Program at the Moffitt Cancer Center and Research Institute in Tampa, FL, was the site for participant recruitment.

Instruments

Each participant was asked his or her age, cancer diagnosis, and other demographic information which were recorded on a demographic data sheet developed for the study.

A nine-item interview guide was developed for the study (see Figure 1). Questions were both open-ended and closed. Location, activity at the time of the fall, and perceptions of what contributed to the fall were topics of the first three items. Falling backward or forward, vitamin administration, fear of falling, and a change in

- Where were you at the time of your last fall?
- What were you doing at the time of your last fall?
- What do you think contributed to your last fall?
- Did you fall backward or forward?
- Are you taking any vitamins (vitamin D)?
- Do you have a fear of falling?
- Have you changed any habits or activities as a result of your fall?
- What would you do differently to avoid a fall?
- Is there any other information concerning a fall that you would like to provide?

Figure 1. Structured Interview Questionnaire

habits were the next four items. Activities to avoid a fall and any other information that the participant may have deemed important were the last two items. The **Eastern Cooperative Oncology Group (ECOG) performance status** measure was used to detect clinician-rated performance status (Zubrod et al., 1960). This measure allows the clinician to rate performance status from a score of 0 (no limitations) to 4 (bedridden).

Procedures

Patients awaiting an outpatient clinic visit were asked whether they had fallen in the past three months and, if so, were invited to participate. Participation in the study required the data collector to telephone the participant soon after the clinic visit. The rationale for the telephone interview was that participants would be more likely to remember events surrounding their falls when not in the clinic and perhaps anxious about treatment-related issues. Also, the interview was conducted via telephone to ensure privacy and required approximately 30 minutes. The interview consisted of nine structured questions. All interviews were audiotaped and transcribed verbatim.

Data Analysis

Data analysis included frequencies and means calculated on performance status and other demographic data. Directed content analysis (Hsieh & Shannon, 2005) was used to extend the published data on falls through a structured series of interview questions that were inspired by previous research. Key concepts were identified in the literature and incorporated into the structured questionnaire. Reviewing the transcripts to recognize similar verbal responses (Owen, 1984) and comparing the findings among participants helped identify themes. Each interview item response as depicted on the transcript was coded and entered into SPSS® [v.18.0] for descriptive analysis (Miles & Huberman, 1993).

Results

The mean age of the population (N = 20) was 76.4 years. Men and women were represented equally. Most of the participants were diagnosed with breast cancer or hematologic malignancies. Most cancer treatment modalities included growth factors, hormone therapy, and chemotherapy. Most of the participants had an ECOG performance status of 0 or 1 (see Table 1).

Most participants reported falls within one month of the interview consent. Falls were reported to occur at home (75%) and away from home (25%). Only four (20%) of the participants who were receiving chemotherapy fell. Only 25% of the participants revealed a fear of falling resulting from the reported fall. Because of the fall, 80% of participants reported that they had altered behavior that was faulted as the cause.

Table 1. Sample Characteristics

Characteristic	n
Age (years)	
\bar{X} = 76.4	–
Range = 70–94	–
Gender	
Men	10
Women	10
Eastern Cooperative Oncology Group performance status	
0	6
1	10
2	2
3	1
Not reported	1
Cancer site	
Breast	9
Hematologic	6
Lung	2
Prostate	2
Colon	1
Cancer treatment	
Growth factors	8
Hormonal therapy	6
Chemotherapy	4
Radiation therapy	1
None	1
N = 20	

Themes identified as activities that were reported to cause the falls were yard work (20%), walking outside (20%), and walking inside (20%) (see Table 2). Themes identified as limitations contributing to falls were walking (40%), physical problems (20%), and general weakness (20%). Physical issues were defined as vision impairment, low blood pressure, and dizziness. Themes of “being more careful” and “using an assistive device” (i.e., a cane or walker) were the most common self-imposed interventions to reduce fall risk. Participants who were receiving chemotherapy reported less intensive activities (with the exception of one person reporting exercise) compared to patients who were not receiving chemotherapy (see Table 3).

Seventy percent of participants reported taking vitamins at the time of the fall. Directions of falls were reported as forward (55%), backward (30%), and sideways (10%). When comparing people receiving chemotherapy with people who were not receiving chemotherapy, all falls occurred at home for the chemotherapy group versus the nonchemotherapy group, who reported falls away from home (33%).

Causes of Falls

The accounts that detail the structured interview question of cancer or cancer treatment causing the fall were identified. One man suggested that he did not attribute the fall to cancer or cancer treatment. “I think anybody in their 80s is going to fall whether they had cancer or

not.” Another participant suggested that, “According to the chemo[therapy] pills I take, I get very dizzy, so I have been very careful.” Another reported that,

Chemotherapy just wiped me out as far as stamina goes, and I’ve got two more sessions of chemotherapy. So hopefully, after Christmas, I’ll be able to see a light at the end of the tunnel.

Another participant believed that her chemotherapy contributed to the fall.

That was between the first and second chemo[therapy], and I also realized that if I stood up very fast that, you know, I would get kinda a really lot of black dots in my eyes and get kinda wobbly.

Limitations Contributing to Falls

Issues of physical problems, general weakness, and walking often were mentioned. One man said,

I went to work out at the gym and I left the gym and I was . . . I had my cane with me and I was attempting to step off the curb and what happened was I lost my balance and I fell. I had no strength in my legs to get up. . . . I just lay on the street.

A woman stated,

At one time I had counted up to 30 falls in the apartment but that was, well, maybe four years ago and I have fallen since. I don’t know how many times I have fallen now.

Another participant said,

I stood up and the pain got me really quick before I could strengthen up and I was bent forward . . . and I banged my head on the door jam. I cut it open . . . I knew what was happening but I could not stop myself [from the fall] because of the pain.

One woman reported that, after she returned home from the hospital for treatment of injuries that occurred as a result of a fall, she continued to feel bad.

I said, “[I] feel sick,” so she ran so I would have something to vomit in, and when she was gone and came back, she said I had a seizure. Well, I believe her . . . so back to the hospital we went again.

Self-Imposed Interventions to Reduce Fall Risk

When asked whether anything different could have been done to avoid a fall, several participants suggested that they would be more careful, wear better shoes, use an assistive device such as cane, and not hurry, whereas others said they had no idea what they would do differently. One man voiced his perceptions concerning fall prevention,

Table 2. Characteristics of Falls

Characteristic	n
Location of fall	
Home	15
Away	5
Effect of fear of falling	
No fear of falling	15
Fear of falling	5
Impact on behavior	
Change in behavior	16
No change in behavior	4
Direction of fall	
Forward	11
Backward	6
Sideways	2
Unknown	1
Activity that caused fall	
Walking inside	4
Walking outside	4
Yard work	4
Bathroom	3
Household chores	3
Exercising	1
Other	1
Perception of cause of fall	
Walking	6
Weakness	4
Objects	3
Physical problems	3
Do not know	2
Careless	1
Medications	1

N = 20

There is no way on God's green Earth that you are going to help people not fall. Maybe I am a cynic, but the way to not fall is to use common sense and don't take chances if you can help it.

Discussion

This study was intended to be the preliminary project for the identification of themes associated with falls in older patients with cancer that can be added to the current nursing assessment. The data revealed personal accounts of how some participants believed that cancer or cancer treatment may have contributed to a fall. Subjective data often capture perceptions of past events and interpretations that can affect future behavior and outcomes (Polkinghorne, 1988). Themes associated with activities that caused the fall were performing yard work and walking.

The themes of "being more careful" and "using an assistive device" were found to be the most common self-interventions to reduce fall risk. Most of the participants reported to have changed behavior that was perceived to have caused the fall. Several participants suggested that they felt weak and stated that, since the fall, they would not perform activities they felt caused the fall. In

addition, the themes of "being more careful" and "using an assistive device" have been corroborated (Lee, Mackenzie, & James, 2008). Only 4 of 20 participants reported that they would not change their behavior. Most participants reported some aspect of perceived carelessness despite some of the reported contributions of a fall being out of their control.

Most falls were reported to have occurred at home, which has been supported in other published studies (Bialoszewski et al., 2008; Formiga et al., 2008). Fall-related patient education must focus on the home environment (Feldblum et al., 2008). People undergoing chemotherapy may fall in the home as a result of some of the common symptoms associated with treatment that may limit distance traveled. However, 80% of the study participants had ECOG performance status scores of 0 and 1. People who are considered to have high physical functioning may partake in activities that enhance fall risk, such as yard work or walking outside (Crowley, 1996; de Rekeneire et al., 2003).

As a result of the fall, only 25% of the participants reported a fear of falling. One published account reported a 46% rate of people who live in assisted living facilities stating that they had a fear of falling (Sharaf & Ibrahim, 2008). A fear of falling is identified in community-dwelling older adult literature as a large variable in the cause of falling (Iinattiniemi, Jokelainen, & Luukinen, 2008), and it was the most frequently reported reason for reduced mobility in a study by Bialoszewski et al. (2008). In patients, after suffering a stroke, the event of a fall inspired the fear of falling again, as did a perceived change in body capability (Lee, Mackenzie, & James, 2008). Lee et al. (2008) concluded that fear of falls is only one risk factor

Table 3. Falls in Participants Receiving Chemotherapy and Not Receiving Chemotherapy

Variable	Chemotherapy (N = 4)	No Chemotherapy (N = 16)
Location		
Home	4	11
Away	–	5
Activity		
Bathroom	–	4
Exercising	1	–
Household chores	1	2
Walking inside	1	3
Walking outside	1	3
Yard work	–	4
Contribution to fall		
Careless	1	–
Do not know	–	2
Objects	2	2
Physical problems	–	3
Walking	–	6
Weakness	1	3

in the syndrome of falls and, that coupled with other activity-restricting factors, enhances fall risk. Perhaps many older adult patients diagnosed with cancer do not recognize body changes and, therefore, do not report a fear of falling.

More people who were not receiving chemotherapy reported a fall. This is contradictory to a study that found that more people who were administered chemotherapy reported more falls (Overcash & Beckstead, 2008). This discrepancy may be a function of the limited number of participants included in the study.

Seventy percent of the participants stated that they were taking vitamins. People who have sufficient vitamin D levels are less likely to fall (Holick, 2005; Larsen, Mosekilde, & Foldspang, 2004). Conversely, people with low levels of vitamin D are associated with poor functional status and fall-related injury (Dukas, Staehelin, Schacht, & Bischoff, 2005). People aged 69 years and older and diagnosed with cancer tend to be at greater risk of vitamin D insufficiency, which may be related to bone loss associated with breast and prostate malignancies (Michaud & Goodin, 2006). It may be that many people report vitamin administration and may not be fastidious in actually ingesting the supplement daily.

Most of the falls were reported to be forward. Forward falls tend to be rather common and can accompany injury to an outstretched hand (Cooney, 2008). Trips and step down-related falls tend to result in forward falls, and slips tend to result in sideways or backward falls, resulting in hip injuries (Smeesters, Hayes, & McMahon, 2001). Several of the participants were hospitalized as a result of their falls; however, no hip fractures were reported. One person experienced a wrist fracture, and another hit her head and had a seizure.

Limitations of this study are a homogeneous sample of educated, Caucasian, middle-class seniors who had adequate social support. Also, the Senior Adult Oncology Program does not see every type of cancer diagnosis; therefore, only several primary malignancies were represented. Additionally, a limited number of participants were recruited for the study, and generalizations may not be applicable to all populations.

Implications for Nursing

Although themes were identified, the accounts of the falls and perceptions surrounding the events were individually different. The complexities of a fall and the perceptions following the event tend to result in the individual participant formulating a risk assessment

specific to his or her situation. Part of the oncology nursing assessment specific to falls must include examining the perceived cause of the fall, activities associated with the fall, and self-imposed interventions to limit risk. In addition to administering a fall-risk scale, encouraging patients to tell their accounts of falls can provide clinical information to help develop individual plans of care. Falls occur for many reasons, and standardized assessment instruments may not reveal the actual story or risks. For example, one participant stated that his fall occurred while he was feeding the birds. When asked to share the events leading up to the fall, he stated that he would climb into the tree when feeding the birds. His fall from the tree resulted in several fractures. The story of the fall was vastly different than the initial report.

Conclusion

Perceptions of physical problems, general weakness, and walking should be evaluated in an oncology nursing assessment in determining at-risk functional limitations. Exploration of perceptions concerning activities that have potentially caused a past fall also should occur. For older patients who have fallen, self-imposed activities such as perceptions of "being more careful" and the use of an assistive device should be evaluated subjectively. Clinicians should ask older adult patients to tell their experiences of falls in addition to using a valid and reliable fall-risk assessment scale. A patient's personal account provides an in-depth dimension of a lived experienced vital to constructing an individual plan of care.

Most falls occurring in older patients with cancer were experienced at home, and obtaining an assessment of environmental risk is an essential part of the clinical assessment. Older adult patients diagnosed with cancer who fall are more likely have higher ECOG performance status, not harbor a fear of falling, and not be receiving chemotherapy. Future research in the area of falls in older adult patients with cancer should involve more patients and various treatment sites.

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1. What portion of our patients can be considered at high risk for falls?
2. What tools do we use to assess fall risk? Are there tools suggested in this article that might be worth considering?
3. What strategies do we use to identify patients at high risk for falls? As an inpatient? As an outpatient?
4. Do we formally instruct patients in fall prevention as part of discharge planning or regular outpatient care?
5. What level of evidence does this research report supply? What should be the next step in regard to this information?

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