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Person-Environment Interactions Contributing to Nursing Home Resident Falls

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Abstract

Although approximately 50% of nursing home residents fall annually, the surrounding circumstances remain inadequately understood. This study explored nursing staff perspectives of person, environment, and interactive circumstances surrounding nursing home falls. Focus groups were conducted at two nursing homes in the mid-Atlantic region with the highest and lowest fall rates among corporate facilities. Two focus groups were conducted per facility: one with licensed nurses and one with geriatric nursing assistants. Thematic and content analysis revealed three themes and 11 categories. Three categories under the Person theme were Change in Residents' Health Status, Decline in Residents' Abilities, and Residents' Behaviors and Personality Characteristics. There were five Nursing Home Environment categories: Design Safety, Limited Space, Obstacles, Equipment Misuse and Malfunction, and Staff and Organization of Care. Three Interactions Leading to Falls categories were identified: Reasons for Falls, Time of Falls, and High-Risk Activities. Findings highlight interactions between person and environment factors as significant contributors to resident falls.

Falls are a common clinical problem for older adults, with significant sequelae that include mortality and morbidity, health care system costs, and physical as well as psychosocial consequences. In the United States, falls resulted in 10,300 deaths among older adults in 2000 (Stevens, Corso, Finkelstein, & Miller, 2006). Falls are the leading cause of injury-related visits to emergency departments (National Center for Health Statistics, 2005), resulting in 1.6 million such visits in those age 65 and older (U.S. House of Representatives, Committee on Energy and Commerce, 2003). National estimates from 2000 place health care costs resulting from fatal and nonfatal falls in older adults at approximately \$19.2 billion (Stevens et al., 2006). These costs include the direct cost of care provided to older adults in hospitals and outpatient settings.

FALL RISK AND PREVENTION IN NURSING HOMES

Each year, approximately half of all elderly nursing home residents experience at least one fall (Hill-Westmoreland & Gruber-Baldini, 2005; Thapa, Brockman, Gideon, Fought, &

Ray, 1996). Studies have indicated that physiological changes and pathological conditions, also referred to as person factors, can increase the risk of falling (French et al., 2007; Kiely, Kiel, Burrows, & Lipsitz, 1998; van Doorn et al., 2003). However, relatively few studies have examined environmental factors, such as poor lighting, faulty equipment, and slippery floor surfaces, as potential risk factors for falls by nursing home residents (French et al., 2007; Harrison, Booth, & Algase, 2001; Hill-Westmoreland, 2003). One of these studies was descriptive in nature (Harrison et al., 2001), and a second was limited to Minimum Data Set (MDS) 2.0 items, which exclude the environment (French et al., 2007). A third study used unit-level environmental data that were not specific to the time of the fall event, revealing environmental relationships that were both unclear and difficult to explain (Hill-Westmoreland, 2003).

Although more than 20 fall risk assessments have been described in the published medical literature (Perell et al., 2001), these tools, and particularly the three designed for use with nursing home populations, are outdated and have not addressed environmental risk factors (Brians, Alexander, Grota, Chen, & Dumas, 1991; Morris et al., 1997; Young, Abedzadeh, & White, 1989). This exclusion is especially problematic because environmental factors are often more readily modifiable than person factors. We are aware of only three studies that have used a nursing home population to study person and environmental risks concurrently (French et al., 2007; Harrison et al., 2001; Hill-Westmoreland, 2003), one of which reported that interactions among these factors increased residents' risk of falling (Hill-Westmoreland, 2003). Because of the temporal limitations of the environmental data in the Hill-Westmoreland (2003) study, additional investigation of the multifaceted complexities of the person-environment interplay is needed.

While many studies have identified factors that predispose nursing home residents to falls, most of these studies, with the exception of two (Harris, 1989; Hill-Westmoreland, 2003), have failed to clearly explicate a theoretical or conceptual framework. Fall prevention literature emphasizes the synergism between multiple risks and highlights the importance of this synergism in identifying individual risks ("Guideline," 2001; Rubenstein, Josephson, & Osterweil, 1996). Similarly, Tideiksaar (1997) mentioned the importance of viewing "the etiology of falls in older people as an interaction between the person (intrinsic factors) and environment (extrinsic factors)" (p. 143).

Lawton's (1982) Ecological Model of Aging (EMA) offers a framework by which fall risk can be conceptualized as encompassing person, environment, and interactive factors. The EMA includes a range of adaptive behaviors, indicating that residents with high competence can withstand relatively greater levels of environmental press or challenge, while those exhibiting low competence are more vulnerable to the demands imposed by the environment (Wister, 1989). We identified one previous study (Hill-Westmoreland, 2003) that successfully used the EMA as a framework to guide the research of person and environment contributors to fall risk and their interactions. High fall risk activities, such as toileting, might reflect nursing home residents' low level of competence in interacting with a challenging physical environment.

In the context of the current study, the EMA (Lawton, 1982) was used in conjunction with the fall risk literature to conceptualize the questions for the interview guide and as a framework to which the findings from our analysis of focus group data could be compared. The results of the current study are being used to facilitate the development of a Person-Environment After Fall Assessment (PEAFA) that will inform the planning of resident-specific interventions to prevent or reduce the risk of falls.

PURPOSE

The purpose of this study was to explore, from the perspective of the nursing staff, the person risk factors, environmental circumstances, and the interaction of the two surrounding nursing home falls. Falls were defined using the Centers for Medicare & Medicaid (2002) MDS 2.0 definition of a fall:

Falls are defined as events in which a resident: is found on the floor, whether or not an injury resulted; lost their balance and would have fallen if not for staff intervention; and the distance from which the resident falls from to the floor is not used to define whether or not a fall occurred. (p. 3-1)

This definition is also the one used by the nursing home corporation from which staff were recruited for participation in this study.

Falls by elderly nursing home residents are multifactorial in nature, with both person and environmental factors contributing to these events. However, the specific role the environment plays in contributing to individual fall events is still poorly understood. Although nursing personnel have the most direct daily contact with nursing home residents, we are unaware of any published studies that have explored their experiences with resident falls. These caregivers are a rich and underutilized source of insight, particularly relating to the complexities of the interplay between person risk factors and environmental circumstances that contribute to nursing home resident falls.

METHOD

Design

Focus groups were conducted to gain insight into the range of person, environment, and interactive circumstances that lead to falls in nursing homes. This method provided an opportunity to capitalize on group interactions and dynamics to yield a wide range of experiential data (Asbury, 1995). The interaction also gave the method a high level of face validity (Krueger & Casey, 2009) because participants' comments could be confirmed, reinforced, or contradicted within the group (Webb & Kevern, 2001). In this study, the use of focus groups allowed for a detailed description of the events surrounding residents' falls and provided insights into the conceptualization of person-environment circumstances from the nursing staff's point of view.

Procedures

Approval to conduct this study was obtained from the University's Institutional Review Board and the Ethics Committee of the mid-Atlantic region nursing home corporation with which the two chosen facilities were affiliated. Two facilities were selected from this nine-facility proprietary nursing home corporation. To obtain a breadth of perspectives, a maximum variation sampling strategy (Morse, 1998; Patton, 1990) was applied in which facilities with the highest and lowest fall rates were selected. In an effort to recruit participants, a member of the research team attended a mandatory nursing staff meeting at each facility the month prior to the planned focus group sessions. In that meeting, the research team member explained the study's purpose and the informed consent process, as well as answered the staff's questions and facilitated study enrollment. Recruitment flyers were also posted on staff bulletin boards.

Focus groups were conducted in a private conference room within each facility. They were moderated by the study's principal investigator (a nurse) and a graduate research assistant, both of whom used strategies to ensure all participants contributed to the discussion. To facilitate discussion, an interview guide (Table 1) was developed based on a review of the

falls literature and Lawton's (1982) EMA. Each focus group was audio recorded and lasted no longer than 2 hours. At the end of the session, participants received \$10 compensation from the study budget and were permitted to count their participation as work time, paid by the corporation.

The study was explained to the participants attending each of the four focus group sessions, and time was allotted to answer any questions. Special emphasis was placed on the need for respecting confidentiality regarding the information shared by the participants (Krueger & Casey, 2009). Those agreeing to participate were asked to sign a consent form. After informed consent was obtained, demographic data were collected from all participants.

Sample

Purposive sampling was used to recruit participants from the two nursing homes with the highest and lowest fall rates and licensed as well as unlicensed staff. This sampling technique and the focus group approach was selected over individual interviews to provide a breadth of perspectives (Morse, 1998; Patton, 1990) regarding the actual circumstances leading to falls in these facilities. Two focus groups were conducted at each facility, one with licensed nurses (licensed practical nurses and RNs), and the other with unlicensed nursing staff (geriatric nursing assistants, certified medical assistants, and nursing unit secretaries). To promote the open sharing of information and avoid hierarchical issues within groups (Krueger & Casey, 2009), licensed and unlicensed nursing staff were interviewed separately.

To be eligible for the study, nursing staff members (licensed or unlicensed) were required to have witnessed one or more fall events involving a nursing home resident. Nursing staff were not eligible if they were not fluent in English or had not witnessed a resident fall event. Four focus groups were held, with a total of 17 participants. Group sizes ranged from 3 to 6 participants: One group had 3, two groups had 4, and one group had 6 participants.

Most participants were women (94%), with a mean age of 46.3 ($SD = 10.4$ years). More than half (58%) of the participants self-identified as Black non-Hispanic, 18% as White non-Hispanic, 12% as Black Hispanic, 6% as White Hispanic, and 6% as American Indian.

The distribution of licensed (47%) versus unlicensed (53%) nursing staff was fairly equal. Participants worked an average of 40.7 hours per week ($SD = 16.5$, range = 8 to 60 hours). Most (65%) worked during the day shift. The average number of years worked at their current facility was 5 years ($SD = 3.4$), and the average number of years at any nursing home facility was 11.5 years ($SD = 10.9$).

Facilities and Residents

The nursing home with the highest fall rates (7.84 falls per 1,000 resident days) had a 168-bed capacity and four units. The nursing home with the lowest fall rates (3.97 falls per 1,000 resident days) had a 148-bed capacity, also with four units. In the low fall rate facility, there was little space for residents to congregate, and the layout of the units provided high visibility of the residents. For example, the dining/activity area was in direct view of the staff. In the high fall rate facility, hallways were longer, and there were more spaces for residents to congregate or visit; cameras were in use to view more remote or unsupervised areas. The two care facilities both met the State of Maryland minimum requirement of 2 hours of bedside care per licensed bed per day, 7 days per week, which included supervisory personnel and a sufficient number of trained and experienced supportive personnel (Administration Requirements, 2008).

Our analysis of a 6-month period of MDS 2.0 data for 237 residents in the high fall rate facility and 172 residents in the low fall rate facility revealed some significant differences between the two facilities. In general, the residents of the high fall rate facility were more mobile than those at the low fall rate facility, with fewer residents who were wheel-chair bound (58.1% versus 73.6%, $p = 0.049$) and more residents who exhibited wandering behavior (10.7% versus 3.5%, $p = 0.009$). Residents of the high fall rate facility were on more antidepressant (2.11 versus 1.29, $p = 0.008$) and anti-anxiety (0.27 versus 0.06, $p = 0.049$) medications than were those at the low fall rate facility. In the high fall rate facility, chairs that prevented residents from rising were in use more often (4.5%) than in the low fall rate facility (0.6%, $p = 0.021$). In contrast, the use of bedrails (1.1% versus 14.6%, $p < 0.001$) and trunk restraints (1.1% versus 7.6%, $p = 0.028$) in the high fall rate facility was less common than in the low fall rate facility.

Data analysis

All four focus group interviews were transcribed and verified against the original audio recording for accuracy. Data were organized and managed using the software programs Atlas.ti[®] version 5.0 for the thematic analysis and NVivo[®] version 7.0 for the content analysis. Thematic analysis was applied to the data to identify the overarching themes and included in-depth open and axial coding (Newton, Alexandrou, Bate, & Best, 2006, Robinson & Cubit, 2007; Saunders & Byrne, 2002; Strauss & Corbin, 1998). The resulting codes were organized into 11 categories describing the staff's view of the circumstances contributing to falls and the surrounding events. On the basis of these categories, three overarching themes emerged: Person, Nursing Home Environment, and Interactions Leading to Falls.

After the thematic analysis was conducted, a content analysis was performed. For the purpose of the content analysis, data were organized in terms of responses to the questions used during the focus group sessions. We also used content analysis after the thematic analysis to assess the agreement of our findings with an existing theoretical framework.

To ensure study rigor, qualitative criteria (Beck, 1993) were evaluated. These criteria included credibility, fittingness, and auditability. To enhance the credibility and auditability of the data, the moderator and co-moderator conducted an audio recorded debriefing immediately after the conclusion of each focus group session to review the field notes and discuss any challenges, such as dominant participants, or to share any observations that occurred during the focus group (Beck, 1993; Creswell, 1998). Auditability was also assured by maintaining detailed memos of the debriefing sessions, as well as the decisions made and actions taken during the process of data collection and analysis. Fittingness was promoted by comparison to the EMA throughout the study. Thus, it was possible to relate the results to this model and determine the placement of findings within the existing literature. Although further investigation is necessary, our findings demonstrate congruence between the data collected and the EMA. The results that follow provide evidence to further support the EMA and its application to conceptualizing the problem of falls experienced by elderly nursing home residents.

RESULTS

On the basis of the analysis, three overarching themes emerged: Person, Nursing Home Environment, and Interactions Leading to Falls. We identified three categories under the Person theme, five under Nursing Home Environment, and three under Interactions Leading to Falls (Table 2).

Theme 1: Person

Person risk factors such as physiological or psychological changes were described as a major contributor to falls experienced by nursing home residents. A remark by one participant invoked agreement from the other participants:

The older you get, the more unstable you get. Or your sight is bad, your distance, your judgment is poor, but people think they can walk. They want to be independent and unfortunately, due to their physical condition they're not able to.

This quotation identifies a variety of age-related and disease-specific attributes of residents that can contribute to fall events. The categories emerging under the Person theme were: Change in Residents' Health Status, Decline in Residents' Abilities, and Residents' Behaviors and Personality Characteristics. Sometimes all of the categories within the larger Person theme were relevant to individual fall events. In most cases, however, only one or two categories were reported as contributing to the fall.

Category 1: Change in Residents' Health Status—Responses from the study participants indicated that a decline in health, both physical and cognitive, increased residents' risk of falling. Physical changes in residents that were mentioned by participants included urinary incontinence, generalized muscle weakness, visual problems, and impaired cognition. As one participant observed, "They're incontinent before they get to the bathroom, so then they slip in their urine along the way," and "It does not help that usually their legs are just like spaghetti." Visual problems were also pervasive, as another participant noted, "I think most of our nursing home residents do have visual problems; cataracts and they lose their glasses." Impaired cognition was another health problem identified across all focus groups. One participant said, "I just think due to their age—they're not able—they don't remember or think of things, forgetful."

Category 2: Decline in Residents' Abilities—Changes in health status often result in a decline in residents' abilities. As one participant noted, problems with gait, balance, and muscle weakness are common: "She's trying to walk. She can't walk. She's not strong. I think she's a little lopsided. She's not balanced." Similarly, participants described residents' diminished ability to judge distance as problematic, as exemplified by one participant's statement: "You see somebody go, they think they know exactly where they're sitting—and *bam* they're off the bed, they're on the floor, they missed their wheelchair. They missed sitting down in one of these stationary chairs."

Category 3: Residents' Behaviors and Personality Characteristics—Behaviors such as the desire for independence, dignity, impatience, and impulsiveness were also cited as contributing to falls. One participant described these behaviors in a resident reported to have some type of dementia:

She's a very proud woman and can walk, but not by herself... so having to wait for someone to come and walk her, seems to just tick her off. It's nothing for her to get up, and say something [like]; "I'm going to work or I'm going to wash out my underclothes." When she gets up and walks, she's guaranteed to fall.

Participants also noted that wandering behavior can lead to fall events, as exemplified by the following: "This lady is a wanderer, and she always walks about everywhere. Even if you sit her down, she's going to get up and start walking all about again." While it was clear throughout all four focus groups that staff tried to prevent fall events resulting from these behaviors, it was not uncommon for the caregivers to want to honor and respect the residents' dignity: "You know, the way I see it—I think every person in here has the right to do as much as they possibly can, even if it's going to cause them to fall."

Theme 2: Nursing Home Environment

The five categories that emerged under the Nursing Home Environment theme were Design Safety, Limited Space, Obstacles, Equipment Misuse and Malfunction, and Staff and Organization of Care. They describe circumstances external to the resident that contributed to falls. The nursing home environment was not always seen as a place where the buildings had been thoughtfully planned to prevent falls, even when it was in the best interest of the residents. One participant observed:

They get these highfalutin' architects to do all this and lay all this stuff down, but you have to remember the elderly with dementia and Alzheimer's, they're not used to walking on the floor that you chose. I just wish somebody would come up with a nursing home floor, a nursing home floor for the elderly. For example, this lady walks with her head down all the time. And she just like shuffle, shuffle, shuffle—and if the floor isn't smooth and there's a bump—*bam*—she's going to trip. When they do these nursing homes they don't think about making it senior citizen, old people [friendly], you know safety wise. They think about pretty. Pretty is not safe.

Category 1: Design Safety—Consistent with the sentiment that the environment was lacking in safety for the residents, one participant reported, “He couldn't reach the [call] button,” suggesting that the location of the call bells may not have been well designed. Participants also detailed problems with both lighting and floor surfaces. As one participant noted, “All nursing homes have florescent lighting. And I am telling you, it's always a factor, it's not bright enough—it is not. Daytime it is but never at nighttime.” In reference to the floors, two issues were apparent—uneven and slippery surfaces: “Not all the floors are so level. There can be little bit of a bump.... The residents come and trip on that and they can fall.” Another participant relayed a problem with slippery floors: “Sometimes we have a problem with humidity coming in on the floors. Slippery to me—it's going to be slippery to them.”

Category 2: Limited Space—When asked what creates the biggest problem within the environment, several participants cited the narrowness of the room, given all of the things that need to go into the space. “It's all your equipment—your oxygen tanks, your [therapeutic] beds, your IV [intravenous] poles, your feeding pump going, and everything else—and the TV,” one observed. “That's half of a room...the other resident has the same.” Another source of crowding is visitors or people: “Then you get the families coming in—which sometimes family may—maybe 10 people...at best you are left with 1 to 2 feet of walkway.” In summary, participants described a room shared by two residents, filled with personal belongings and equipment, with a small walking path.

Category 3: Obstacles—The lack of space and preventive design accentuates the fact that obstacles are clearly present throughout these facilities. With regard to the residents' rooms, participants mentioned several items that became obstacles, such as “bed cranks people did not push under,” “bedside tables,” “fall ease mats,” and “sliding on powder on the floor.” One participant observed, “There's so much furniture and things in the room so a lot of times what I notice some of the nursing assistants do in this facility is they would pull the wheelchairs out and put them in the hall and store them.”

In addition to wheelchairs, other obstacles reported in the hallways were “6 foot 2 [inch] linen carts,” “medicine carts,” “tripping over shoes,” and interestingly, “other residents.” Several participants attested to seeing “residents clipping [tripping] other residents.” A description one participant offered was particularly telling: “Residents that are alert, they become annoyed with the residents that are confused, that are constantly in their way.” The obstacles were clearly present in both resident rooms and common areas such as hallways.

Category 4: Equipment Misuse and Malfunction—Participants not only described the equipment as an obstacle but also discussed its misuse and malfunction. Falls often occurred when residents used equipment for purposes other than that for which it was originally intended, such as using over-bed tables and wheelchairs as walkers. For example, one participant commented:

A lot of our patients, because they want to hold onto something—I don't know what it is about wheelchairs, I guess it's the idea that something is moving and they can hold on to it, like it's a cart or something—next thing you know, they are going down [the hallway] with those wheelchairs.

Equipment that was not properly functioning also contributed to falls. Another participant reported, “Wheelchairs do not lock. I have seen somebody get up from the wheelchair and attempt to lock their wheelchair. When they get up it just goes back, and they go down. The brake pads are gone.”

Category 5: Staff and Organization of Care—Study participants perceived staff as an important resource for preventing falls from occurring within the nursing home environment. The Staff and Organization of Care category was the only one within our three themes in which differences between the high and low fall rate facilities were apparent. In general, the need for more staff was an issue raised by participants from the high fall rate facility. In the low fall rate facility, the staff worked as a team, anticipated needs, and made frequent rounds to prevent falls. The quotations that follow provide more details.

When asked what one thing most contributed to the low fall rates, the overwhelming response from both licensed and unlicensed staff participants who worked at the facility with the lowest fall rates was “frequent, frequent, frequent rounds.” Participants also reported, “We're there and we anticipate things, and so more of our falls are easing residents to the floor, instead of them just actually falling.”

Fall prevention was also seen as a team effort there. One participant described, “It's everybody's job. Everybody that works those floors down to the people in housekeeping. It's everyone being conscientious. It's just staying focused, trying to prevent them.” Team effort was directed not only at keeping a close watch over the residents but also “knowing them too. You have to know your residents.” The importance of careful risk assessment was also mentioned by a participant who stated, “I think that the key is assessment. We immediately start looking at what we need to put in place to prevent them from falling again. I think that that has a lot to do with it.”

Conversely, the participants employed at the facility with the highest fall rates attributed their high incidence of falls to the need for “more staffing,” suggesting, “I just think that there's a possibility that we just do not have enough staff to see to all of their needs.” They also described how more staff might help: “If you got more staff during busy times, then you've got more staff here to observe the residents that are up doing things.”

Theme 3: Interactions leading to Falls

Circumstances that contributed to falls did not occur in isolation, regardless of whether they were related to the person or the environment. More often than not, participants described residents' falls as resulting from a multitude of interacting factors. This can be seen clearly when the theme Interactions Leading to Falls is considered in terms of the following categories: Reasons for Falls, Time of Falls, and High-Risk Activities.

Category 1: Reasons for Falls—A review of the individual fall events described revealed that the reasons for residents' falls were multifaceted. The situation or

circumstances of such events are complex in nature, as reflected in the following observation of a resident:

She was sitting on the edge of the bed eating her breakfast. I mean—I have to say the bed wasn't locked. She was alert and oriented. She was ambulatory with assistance; however, when she tried to get up, the bed [slid] out from underneath of her. So it really wasn't anything she was doing wrong. Wasn't anything on the bed that was out of place. She was of course, in her hospital gown, had a brief on. Now the briefs are plastic—I guess they could slide a little bit, but the bed was not locked. So therefore she had nothing to [do with it].

This episode demonstrates that the environment, together with the resident's action, can contribute to the reason for a fall.

While faulty equipment was sometimes a clear contributor to falls, several study participants also described residents failing to appropriately use the equipment's safety features: "They don't lock the chairs, so they will still try to stand up and in the process of standing up—your chair is going to go back." In these situations, the interaction between the person and the environment was perceived as a fall risk that was primarily internal to the resident.

Category 2: Time of Falls—Participants described times at which falls were more likely to occur than others, one of these being "during change of shift," when there was "no overlap of staff." Those times were often portrayed as "chaotic" and "helter-skelter." Participants at both facilities also discussed residents falling during "busy times," such as mealtimes, when staff might be involved in providing for a variety of residents' needs. Mealtimes were a time when residents with various needs for assistance were described:

You have a certain time frame to get these trays out, set up, prepared, and help these people start eating. Then you have the "feeders." The first cart might be for all independent people, but you still gotta [*sic*] set up. Some need more assistance than others. You gotta keep food hot. If it gets cold then you've got to take it, heat it up, and bring it back.

One participant described the shift change as a time when staff may be called away from the unit: "They'll make an announcement—'All units come down and get your residents from the activity program and bring them back to the unit.' This means evening shift staff leaving the unit to bring the patients up, while there are still patients up on the floor that somebody needs to be watching." This participant further expressed, "The lights all come on at the change of shift. And they say, 'Well nobody is answering the lights'—but you want us to get [the] report, so we'll know what's going on." These quotations highlight the change of shift as a particularly chaotic time that might contribute to residents' risk for falls.

Category 3: High-Risk Activities—Certain activities, when performed by residents without assistance, such as reaching or transferring/standing to use the toilet, can place them at risk for falls. One example of reaching that led to a fall event was described by a participant:

You see somebody—a little confused person sitting there and they've dropped their straw or their watch, or whatever—and they are hanging out over their wheelchair trying to grab, and the more they grab, the further they go on and pretty soon, you just know what's going to happen.

Another participant highlighted a fall event that resulted during a transfer to the toilet: "He was going into the bathroom and transferred. I guess he missed, and he wound up right beside the toilet." Similarly, when asked why the resident fell, one participant responded, "Trying to get to the bathroom, unsteady gait, medication combination, also someone not

assisting her right then and there when she needed it.” This quotation demonstrates that doing an activity unassisted, in combination with other circumstances, can lead to a fall.

DISCUSSION

The findings from this thematic and content analysis are consistent with the literature on nursing home falls but shed new light into the person-environment interactions leading to falls. Furthermore, although we were not specifically attempting to test Lawton’s (1982) EMA, our findings are consistent with the major components of this theory. All three categories that emerged from our Person theme are supported by previous studies demonstrating that changes in physiological and pathological conditions significantly increase fall risks (Kallin, Gustafson, Sandman, & Karlsson, 2005; Kiely et al., 1998; van Doorn et al., 2003). Participants’ quotations related to the person factors provided examples of physiological changes and symptoms (e.g., wandering, impulsiveness, lack of awareness of one’s own abilities, visual-spatial misjudgment of distance) resulting from disease processes such as dementia (Rabins, Lyketsos, & Steele, 1999), which is known to occur in as many as 48% of elderly nursing home residents (van Doorn et al., 2003).

Our findings provide a stronger temporal argument regarding environmental factors than those of other studies (French et al., 2007; Hill-Westmoreland, 2003) because our questions and probes directly asked participants to describe the environment at the time of the fall event. This research yielded five categories within the nursing home environment that contributed to falls; these results are consistent with the findings of previous studies and Lawton’s EMA, indicating that environmental factors increase the risk of falling (Harrison et al., 2001; Hill-Westmoreland, 2003). Although nurses can play a large role in modifying residents’ environment to reduce the risk of falls, a careful balance must be observed to design environments that not only encourage autonomy but also promote safety. In this study, one new insight related to nursing home staff was the importance of the role staff can play in reducing fall rates by better knowing the residents. This finding highlights the importance of continuity of care providers and a culture of caring, in which an interdisciplinary group of individuals is involved in fall prevention efforts in an applied way.

Our study participants discussed times of the day when falls were most likely to occur as being “busy times” and at the “change of shift.” Trends in the 24-hour incident report data for a 6-month period for the two facilities supported both of these descriptions. The largest proportion of falls (13.4%) occurred between 6:00 p.m. and 8:00 p.m., when staff reported:

Right after dinner we get ready to put everyone in bed. So everybody will be able to go around trying to turn our beds down. You know, go get one at a time out of the day room. Getting them ready for bed while we’re in there washing—putting them in bed, and the next thing you know, you look around and so and so is on the floor. Then everybody go running [*sic*]. You know, it’s like they know when we get busy.

The second largest proportion of falls (11.9%) occurred from 2:00 p.m. to 4:00 p.m., the period during which the change between day and evening shifts takes place. Our findings are consistent with a recent 12-month retrospective study of incident reports in English and Welsh hospitals (Healey et al., 2008), in which 3:00 p.m. to 4:00 p.m. and 7:00 p.m. to 8:00 p.m. were found to be peak times for falls. Our results are also consistent with one much older study of nursing home resident falls for a 3-month period during which the greatest frequency of falls occurred during changes in nursing shifts (Kalchthaler, Bascon, & Quintos, 1978). These findings have potential implications for nursing home administrators and directors of nursing who may want to consider scheduling additional geriatric nursing assistants during times in which facility trends indicate falls are most likely to occur.

In a nursing home setting, in which residents are often frail and have multiple person risk factors, such as visual impairment, individuals are unable to withstand high levels of environmental challenge. Unfortunately, adverse environmental factors such as those described in this article can create additional challenges for nursing home residents, placing them at even greater risk of falling; this observation is congruent with Lawton's (1982) EMA. Other theoretical fall prevention literature has suggested the importance of appreciating that synergism between multiple risks can be just as critical as identifying individual risks ("Guideline," 2001; Rubenstein et al., 1996). This study provides support for the person-environment interplay that often occurs in circumstances surrounding nursing home resident fall events. An example of synergism of multiple risk factors from our study is the residents' desire to be independent, combined with the limited availability of staff, in an environment crowded with obstacles that was not adequately designed with older residents in mind.

LIMITATIONS

A potential shortcoming of this study involves the possibility of bias resulting from use of a nonprobability purposive sample, having only 3 participants in one of the groups, and the lack of representation of night shift staff. Thus, it is possible our findings do not account for the full range of experiences and factors associated with fall events that occur in nursing homes. However, it is important to note that according to incident reports for a 6-month period in the two facilities in which our focus groups were conducted, the smallest proportion of falls (17%) occurred on the night shift. This finding is consistent with a previous study that reported that only 16% of all falls in a skilled nursing facility occurred during the night shift from January to June 2007 (Lester, Haq, Vadnerkar, & Feuerman, 2008).

Upcoming research could address these challenges by attempting to randomly select from a purposive group of willing staff and to overrecruit from the pool of potential participants (Krueger & Casey, 2009). Future studies involving a larger sample of nursing staff representing additional nursing homes would provide greater depth of experience related to resident fall events. Expanded data collection would allow for interfacility and licensed-versus-unlicensed nursing staff comparisons that were not possible in our study due to the limited time constraints and study resources inherent in this small pilot.

In the current study, the issue of potential bias was addressed and minimized in several ways: First, the interview guide was carefully designed to capture a wide variety of experiences with fall events by including a comprehensive list of questions and probes; it was developed after an exhaustive literature search and was reviewed by the research team, clinicians, and an expert in older adult fall risk and prevention. Second, the average period of time the participants reported working at any nursing home was greater than 10 years; those with many years of experience would be expected to have a broader understanding of falls occurring across nursing homes.

CONCLUSION

Prior work has failed to identify the many environmental circumstances and multiple interactive risk factors that contribute to nursing home resident fall events. This study has successfully used a focus group method to capture nursing staff members' experiences with these events. This method has highlighted the importance of the interaction of the older resident with the nursing home environment as a contributor to fall events, a relationship that had previously been described only in non-data-based publications. A special focus on the modification of environmental circumstances appears to be critical, as they are often

more easily and efficiently addressed by nursing staff and an interdisciplinary fall prevention team. The study findings are currently being used to create a PEAFa tool to allow for a more comprehensive understanding of the specific contributors to these falls, to better predict and prevent repeat falls in nursing home settings.

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TABLE 1

Sample Questions from the Interview Guide

1	Think back to the last time you saw a resident fall. Now I would like each of you to take a turn describing this fall event.
2	Please describe any traits, features, or characteristics about the resident(s) that might play a part in falls. What is it about the resident that might play a role in the fall events?
3	What were the resident(s) doing or trying to do when they fell?
4	Describe physical objects or things in the nursing home environment that you can touch and/or see that may contribute to fall events.

TABLE 2

Themes and Categories Derived from the Analyses

Themes	Categories
Person	<ul style="list-style-type: none"> • Change in Residents' Health Status • Decline in Residents' Abilities • Residents' Behaviors and Personality Characteristics
Nursing Home Environment	<ul style="list-style-type: none"> • Design Safety • Limited Space • Obstacles • Equipment Misuse and Malfunction • Staff and Organization of Care
Interactions Leading to Falls	<ul style="list-style-type: none"> • Reasons for Falls • Time of Falls • High-Risk Activities