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Nursing staff's awareness of keeping beds in the lowest position to prevent falls and fall injuries in an adult acute surgical inpatient care setting

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Abstract

High beds are a safety concern. This qualitative study used pre-existing nurse interview data and confirmed nurses' awareness of the importance of keeping patient beds in the lowest position. Lowering the bed helps promote patient safety and prevent falls.

Keywords

Hospital; patient safety; beds; patient room; accidental falls

Introduction

Falling out of bed was a patient safety concern and perceived as preventable patient harm in hospital settings (Anderson, Boshier & Hanna, 2012). Foster and associates (2004) claimed that the majority of falls and fall-related injuries in the elderly could be prevented with thorough evaluation of existing extrinsic factors (e.g., medications), intrinsic factors (e.g., lower extremity weakness, gait and balance disorders, bone mineral density), and environmental hazards, and through introducing therapeutic and preventive interventions as appropriate. They also emphasized that prevention strategies should aim to minimize patients' risk of falling without compromising mobility or functional independence. Both Foster and associates (2004) and Quigley and associates (2007) accentuated that protecting patients from falls and minimizing the severity of fall-related injuries require a shared responsibility among the members of an interdisciplinary team (including health care

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providers, administrators, risk and quality managers). Quigley and associates (2007) suggested analyzing fall rates by type of falls and severity of fall-related injuries and integrating charts and graphs into fall prevention program evaluation at point of care. This approach could help the interdisciplinary team members examine the effectiveness of their interventions and program outcomes. In other words, taking a systematic multi-facet approach to prevent falls and fall-related injuries, including documenting the effectiveness of the fall prevention interventions, is an emerging trend and needed.

Height of patient beds is a concern

A recent study (Tzeng, 2010) in an acute care hospital in Michigan found that 51.4% of the adult inpatient fall incidents and 56.0% of the adult inpatient injurious falls occurred while the patient was getting out of or back to the bed. The review study on interventions designed to prevent healthcare bed-related injuries in patients conducted by Anderson and associates (2012) concluded that the effectiveness of the two interventions designed to prevent patient injuries from their beds (low height beds and bed exit alarms) remains inclusive. The two identified clinical trials found that no significant increase or decrease in the injurious fall rates with the use of low height beds and bed exit alarms in hospital settings. Regardless of lacking evidence to show the effectiveness of using low height beds to prevent bed-related falls, a recent study on the effectiveness from the implementation of a facility-specific evidence-based falls prevention intervention program in residential aged care in Australia conducted by Nitz and associates (2011) also included using high-low or low-low beds as one of the environmental modifications. Nitz and associates' (2011) study found a significant reduction in the numbers of fall incidents and this reduction was sustained in the 6-month follow-up.

In addition, recently discharged older adults claim that hospitals should provide lower patient beds. Staff should bring patient beds to the lowest level after they have finished providing care to patients. One family member emphasized that hospital beds were so high that patients' feet dangled when they were getting out of bed (Tzeng & Yin 2009). If so, what is the safe height of a hospital bed? Capezuti and associates (2008) claimed that the bed height that is too high (> 120% of lower leg length) can result in unsafe transfer and bed-related falls because of foot placement instability. The retrospective observational study conducted by Capezuti and associates (2008) used secondary data of 263 frail residents from 4 nursing homes in the United States. This study found that 93.9% of the residents had bed heights greater than 120% of lower leg length, with more than 75% having bed heights greater than 140% of lower leg length. However, this study was unable to determine what proportion of bed-related falls is attributable to bed heights. In practice, adjusting the bed height to the patient's lower leg length is often not feasible.

Keeping beds in the recommended low position as one of the fall prevention interventions

To ensure patients' safety as patients get in and out of bed, if very low beds are not available, the bed should be kept in the lowest position possible (Hartford Institute for Geriatric Nursing 2008; Joint Commission, 2007). However, the study conducted by Tzeng and Yin (2008) found that the average height of patient beds on fall precaution was significantly higher than of those not on fall precaution. It was suspected that in an effort to prevent high-fall-risk patients from falling, nurses may have consciously or unconsciously kept their beds in higher positions. Thus, it is commonly assumed that nursing staff, who provide direct inpatient care, are aware that keeping a bed in a low position is important for preventing falls and fall-related injuries. Despite this assumption, patient beds are not typically kept in the recommended low position. To date, no studies have examined nursing staff's awareness of the importance of keeping patient beds in a low position.

Purpose

The purpose of this qualitative study was to explore nursing staff's awareness of the importance of keeping patient beds in the lowest position to prevent falls and fall injuries in adult acute inpatient care settings. The research question of this study was: Do nursing staff aware of the importance of keeping patient beds in the lowest position to prevent falls and fall injuries? We used pre-existing interview data to abstract relevant information to answer the research question.

As for the importance of this study, it focused on staff's awareness of the need to keep patient beds in the lowest position—a staff-centered process indicator—because of its potential effect on nursing staff's compliance with the recommendation and the likelihood for inpatients to suffer injurious falls during hospital stays. We assume that only staff will adjust the overall height of the beds because the height-adjustment controller is not accessible to patients when they are lying on the bed.

Method

Design

This qualitative study used pre-existing interview data to answer the research question. The pre-existing interview data was from semi-structured interviews, which were conducted with nursing staff in a 52-bed adult acute inpatient surgical unit with medical overflow in a community hospital located in Michigan, USA. The semi-structured interview data were from an interdisciplinary collaborative pilot project, which tested the usefulness of the bed height alert system from September 2010 to April 2011. The pilot project was approved by the institutional review boards of the study hospital and the corresponding author's home university.

The interview data, as part of the formative evaluation of the bed-height alert system, was collected to understand nursing staff's perceptions of the usefulness of the bed height alert system. Interviews of nursing staff were conducted between January 4 and April 4, 2011.

A brief overview of the bed-height sensor network—The alpha prototype of the bed-height sensor network was developed to measure and record bed height (Tzeng, et al., 2012). The intention of this system was to increase staff adherence to keeping beds in a low position as a fall prevention strategy. It generates computerized reminders to enhance staff adherence to bed height recommendations. A sensor located under each bed collects bed height measurement and sends information to a central touch-screen computer in the nurse's station that displays the state of the bed. Fifteen out of the 52 beds had bed sensors. Bed height was measured every 10 minutes. The bed height in the lowest position was 24 inches from the top of the bed frame to the floor. If a bed height was 2 inches above the lowest height in two consecutive measurements, staff would be notified by a blinking yellow alert on the central computer. If a bed was left high for more than 30 minutes, the on-screen high bed alert turned red to indicate noncompliance (Tzeng, et al., 2012).

Note that all licensed and unlicensed assistive nursing personnel participated in the education sessions, with their participation counting toward their on-job training hours. Staff members were requested, but not required to respond to high bed alerts. There are no comparative data for before and after deploying the sensors (Tzeng, et al., 2012).

Selected characteristics of the study unit—The characteristics of the study unit were presented using the data collected during the study period from September 2010 to March

2011. Since the last interview of nursing staff was conducted on April 4, 2011, the April 2011 data was not included in this section.

The nursing hours per patient day (HPPDs) ranged from 8.54 to 10.00 and the registered nurse HPPDs ranged from 4.83 to 5.68. The total fall rates per 1000 patient days ranged from 2.02 to 8.22. The injurious fall rates per 1000 patient days ranged from 0 to 2.02. A total of 33 falls documented from September 2010 to March 2011,including eight falls with a minor or moderate level of injury. According to the information documented in these fall incident reports, the average age of the fallers was 77.45 years (SD = 12.92, range: 46–98). Twenty seven of them were identified as at high risk for falling and twenty five had a fall protocol in place prior to the fall incidents. Only one faller had physical restraint in use. Only one faller had a previous fall. A total of 14 falls were bed-related or occurred at the bedside (e.g., getting out of or back to the bed, slipping from the bed edge, climbing out of bed, moving from the bedside chair to or back to the bed).

Data source and collection

Participants—Inclusion criteria for staff participants were 21 years or older, able to communicate in English, employed as regular staff members for the study unit, and responsible for delivering direct patient care (either registered nurses [RNs] or patient care assistants [PCAs]). Travel and contingent staff were excluded. A total of 40 RNs and 29 PCAs working in the study unit met the inclusion criteria. All the staff members who met the inclusion criteria are invited to participate in the study. The unit director gave permission for the interviews to be conducted during work hours. Staff members were recruited via face-to-face invitations and interviewed individually during work hours.

Data collection procedures—Before starting the interview, each interviewee was given an informed consent form as the information for the interviewee to keep (no signature was needed). Participation was voluntary and anonymous. Each interview lasted about 5 minutes, and each participant was given a token gift to show the appreciation of the research team for their participation and time. With each participant's permission, the interviews were recorded to assist documentation; no identifiers were recorded or documented. To reach most of the staff members working on the floor, one trained research assistant made a total of five visits to the study unit to interview nursing staff at different shifts.

Data collection tool—A short semi-structured interview guide, including two open questions and four questions using a 10-point Likert scale, was developed by the research team and used for data collection for the pilot project. The interviews with nursing staff members were meant to examine the utility, feasibility, appropriateness, and accuracy of the reminder intervention in order to determine or modify the format. The two open questions were: 1) What comments do you have about the alert for lowering the bed? and 2) What experiences did you have using the alerts that were beneficial or detrimental to your work in patient care?

For each interview, the trained research assistant marked the shift the interview was conducted (1=Day shift, 7 a.m. to 3 p.m., 2=Evening shift, 3 p.m. to 11 p.m., 3= Night shift, 11 p.m. to 7 a.m.) and the job title of the job title of the interviewee as shown on the interviewee's ID badge (1= RN, 0 = Patient Care Technician/Nurse Aid).

In this paper, we presented the themes developed from the interviewees' responses to the first question (What comments do you have about the alert for lowering the bed?). We believed that the information from this question could help us understand nursing staff's awareness of the importance of keeping patient beds in the lowest position based on their input toward the bed-height alert system. The bed-height alert system was designed to

prevent bed-related fall injuries. It is recognized that using pre-existing interview data to answer our research question is a study limitation, because we did not directly ask nursing staff what extend is their awareness of the importance of keeping patient beds in the lowest position to prevent bed-related fall injuries.

Data analyses

Interviews were transcribed by the trained research assistant. Two members of the research team assessed the transcripts independently using content analyses. Discrepancies in the developed themes and threads (verbatim) between the two researchers were discussed until a consensus was reached.

Findings

Results

A total of 18 RNs (58.1%) and 13 PCAs (41.9%) were interviewed. The response rate was 44.9%. Three to ten participants were interviewed on each of the five interview dates. Nine interviews (29.0%) were conducted during the day shift, 15 (48.4%) during the evening shift, and 7 (22.6%) during the night shift.

The responses to the question “What comments do you have about the alert for lowering the bed?” were merged into four themes:

1. Promoting patient safety and preventing falls: “It’s a good thing, just to monitor patient safety, especially on the elderly confused patients…knowing that bed is in the lowest position is important.” “It let us know that the bed has to be lowered…I do find it beneficial.” “A lot of times [the beds] are left up.” “Anything preventative is always best.” “If the patient is so high, they’ll have a higher fall. They’ll hit the floor harder…It would be better for it to be in a lower position then up in the air. I always try to put mine back.”
2. Effectively monitoring bed heights from the nurses’ station, but not from the hallway: “We can see if we walk down the hall if our beds are out of compliance, but this way if we’re at the front desk it makes it easy to see which rooms we specifically need to get in to fix.”
3. Difficulty in tracking the sensors due to frequently moving beds off the unit: “We used to take the beds off the unit a lot, and some of the sensors I think got lost.”
4. Alerts with visual and voice: “Does it ding or flash?... If it had more [sound] it would cue us in to look.”

Study limitations

As a study limitation, only 31 RNs and PCAs participated in the interviews, with a response rate of 44.9%. Staff indicated that their heavy workload and lack of time was the reason for non-participation. The other study limitation was due to using retrospective interview data. The reported retrospective interview data used in this paper did not have results of the bed-height sensor network with regards to the reduction of injuries as a result of failure to maintain bed height in the low position or ways in which the compliance with maintaining beds in the low position was improved or changed.

Conclusions

The research question of this study was answered using pre-existing interview data. Based on the threads of the first theme of promoting patient safety and preventing falls, this study

confirmed nursing staff's awareness of the importance of keeping patient beds in the lowest position and their appreciation of the usefulness of the bed-height alert system to prevent bed-related falls. Staff also expressed that it is important to monitor the bed height, especially for confused elderly patients and those patients who are confused and/or at a high risk for falling. As for future research directions, additional research is needed to learn whether nursing staff are compliant with the recommendation of keeping beds in the lowest position. Physicians' awareness of the need to keep beds in the lowest position also needs to be explored in future studies.

As for the practical implications, when performing procedures or treatment, staff should adjust the patient bed height to their own working height to avoid suffering back injuries. Bed heights should be lowered as soon as the procedures or treatment are completed; that is, beds should be in a high position only when performing treatment or procedures. Hospital policies should clearly state this expectation to prevent bed-related fall injuries. Based on nurse interviewees' input, this policy is especially important to confused elderly patients and those patients who are confused and/or at a high risk for falling. Hospitals should also consider using low-rise beds for patients with a high risk of falling (Hartford Institute for Geriatric Nursing 2008).

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