

Fall Risk and Nursing Problems of Patients in Medical Units

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Key Words: fall risk, nursing problems, medical units.

Summary. The aim of the study was to assess a fall risk and to identify nursing problems of patients in medical units.

Methods. The study was performed in two medical units at a teaching hospital from January to March of 2017. In total, 165 patients participated in the study: $n=90$ (response rate, 90.0%) from the Cardiology Unit and $n=75$ (response rate, 75.0%) from the Neurology Unit. The Morse Fall Scale was employed to assess a fall risk of patients. To assess nursing problems, a special form was developed in relation to the literature review. The study protocol was approved by the Centre of Bioethics at the Lithuanian University of Health Sciences (no. BEC-SL(B)-161).

Results. Half (50.3%) of the patients had a high fall risk. More frequently, patients had a high fall risk in the Neurology Unit (64.0%), and a minor fall risk was relevant to half of the patients (52.2%) from the Cardiology Unit. The Cardiology Unit patients under the age ≤ 44 years did not have any fall risk at all although half of the Neurology Unit patients (50.0%) of this age had a minor risk and one-third (33.3%) had a high fall risk.

In both units, the patients who did not have a fall risk walked without assistance. In the Cardiology Unit, 54.3% of the patients with a high fall risk walked with a stick or a crutch. More than half of the patients in both units (57.1% in the Cardiology Unit and 56.3% in the Neurology Unit) with a high risk of falls had sleep problems. The patients with no risk of falls had no fear of falling and those with a high risk of fall felt fear of fall frequently (respectively, 37.1% in the Cardiology Unit and 39.6% in the Neurology Unit). The patients with a high risk of falls in both departments more frequently had impaired urinary elimination – nocturia (60.0% in the Cardiology Unit and 68.8% in the Neurology Unit). The patients with a high risk of falls usually had more nursing problems.

Conclusions. A high risk of falls was revealed to be a problem not only for older adults but also for younger patients, especially in the Neurology Unit. The patients with a high risk of falls usually had more nursing problems; thus, fall risk assessment and management must be integrated in nursing care planning and implementation.

Introduction

Accidental falls are the most common safety incidents affecting hospital inpatients and care-home residents (1). A fall may result in fractures, lacerations, or internal bleeding, leading to increased health care utilization (2). Research shows that close to one-third of falls in hospital can be prevented (3). Morse (1987) analysed falls in hospital and classified them into three types (4). Physiological (anticipated) falls are in-hospital falls; these are the falls that occur in patients who have risk factors to fall and can be identified in advance, such as abnormal gait, altered mental status, frequent toileting needs, or high-risk medications. Physiological (unanticipated) falls are the falls that occur in a patient who is otherwise at a low fall risk, because of an event whose timing could not be anticipated, such as a stroke, seizure, or syncope episode. Accidental falls occur in otherwise low-risk patients due to an environmental hazard.

Improving environmental safety at a health care facility will help to reduce fall risk in these patients and would be helpful for all patients in hospital.

Oliver and colleagues (2004) reviewed fall risk factors and identified five risk factors to falls in acute care that were consistent across studies: unsteady gait, increased toileting needs, confusion, sedative-hypnotics, and history of falling (5).

Patients in hospital have a high risk of falls also due to diseases such as neurological illnesses, cardiovascular illnesses, urinary, intestinal incontinence, problems with balance, strength or vision, gait alterations, and adverse reactions to different medications (6). The prevalence of falls due to cardiovascular disorders remains largely unknown. Orthostatic hypotension, neurally mediated syncope, cardiac arrhythmias, and structural heart disease may present as unexplained falls as well as syncope in older people (7). Heart-failed patients who have poor gait and balance use benzodiazepines and digoxin are at a greater risk of falling (8).

The etiology of falls is multifactorial; the connection between falls and disturbances of the

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sensorimotor system has been frequently found in elderly patients with neurological diseases (9). One study showed a high percentage of neurological inpatients identified at risk for falls (10). Falls in neurological patients are particularly linked to medication and disorders affecting gait and balance (11).

In Lithuania, Janušonis & Vaitiekienė (2013) analyzed the causes of patients' falls in hospital according to patients' opinion (12); the more frequent causes were dizziness, disorder of balance and walk, nervous systems disorders, environment and medicines. In another study (13), all patients admitted to a nursing and supportive treatment hospital had a minor or a high fall risk and almost half had at least one fall during treatment in hospital.

Assessment and prevention measures of a patients' fall risk were revealed in different hospital units, and patients in every unit had common risk factors and specific diseases that could be intrinsic risk factors of falls. Nurses hold key leadership positions and clinical practice roles, vital to shaping high performance fall outcomes at the organizational, unit, and patient levels through leading/coordinating multi-component individualized care planning with interdisciplinary teams (14). Nurses must know nursing problems that can affect an increase in the fall risk. Nurse leaders should be responsible for and encourage the implementation of measurement systems that support patient safe culture, and reduce risk and harm to patients. The nursing diagnoses, understood as scientific interpretations of the collected data, guide planning and implementation of interventions to obtain the best results and to constitute fundamental elements for evidence-based nursing, taking into account the patients' needs, safety and fall prevention. A program designed to prevent falls and injuries from falls is an additional practical implication for reducing the risk and harm to patients.

The aim of the study was to assess the fall risk and to identify nursing problems of patients in two types of medical units: cardiology and neurology.

Methods

Study Design and Sample. The cross-sectional study performed at a teaching hospital. The data were collected between January and March, 2017, in the Cardiology Unit and Neurology Unit. The patients' inclusion criteria were as follows: written agreement to participate in the study; age ≥ 18 years; and the ability to speak in Lithuanian. The exclusion criteria were terminal illness and severe disorder of cognitive function. In total, 165 patients participated in the study: $n=90$ (response rate, 90.0%) in the Cardiology Unit and $n=75$ (response rate, 75.0%) in the Neurology unit.

Study Organization. Two authors (MD and JS) collected the data in the most convenient time for

patients and unit staff. Data collection for one patient lasted about 20 min. A pilot test was performed ($n=8$) before the gathering data.

Instruments. Morse and colleagues (1989) developed the Morse Fall Scale (15). Prof. Janice Morse gave permission to translate and use the scale in the Lithuanian language. The Morse Fall Scale was used to assess the fall risk for study patients. The items included history of falling, secondary diagnosis, ambulatory aid, intravenous access, gait and mental status evaluation. The scores range from 0 to 125 and indicate no fall risk (0–24 points), a minor risk (25–50 points) and a high risk (≥ 51 points).

Nursing problems such as fear of falls, pain, mobility impairment, sleep pattern alteration, and impaired urinary elimination were assessed by the special form that was developed by the authors in relation to the literature review. Additional information was gathered from medical documentation (Form No. 003/a and Form No. 027/a).

Ethical Consideration. The study protocol was approved by the Centre of Bioethics at the Lithuanian University of Health Sciences (no. BEC-SL(B)-161).

Statistical Analysis was carried out on Statistical Package for Social Sciences (IBM SPSS Statistics) version 17.0 (16). The data were analyzed using χ^2 test criterion and the comparisons were made between age groups. The difference was considered statistically significant when $P \leq 0.05$.

Results

General Characteristics of Patients. The mean age of the patients in the Cardiology Unit was 67.49 ± 14.01 years, and in the Neurology Unit, it was 53.85 ± 17.02 years. The oldest patient was 89 years. The largest group of the patients in both units was 60–74 years, although the patients were younger in the Neurology Unit. In the Cardiology Unit, most of the patients were men (57.8%); meanwhile, in the Neurology Unit, the majority were women (62.7%). In both units, the majority of the patients arrive from town and were married. The general characteristics of the patients are presented in Table 1.

Patients' Fall Risk Assessment

The fall risk of the patients was assessed using the Morse Fall Scale (Table 2). Half (50.3%) of the patients had a high fall risk. In the Neurology Unit, the patients had a high fall risk more frequently (64.0%), while in the Cardiology Unit, most of the patients had a minor fall risk (52.2%) ($P=0.005$).

The fall risk in medical units was significantly related to patients' age. In the Cardiology Unit, the patients under the age of ≤ 44 years had no fall risk although in the Neurology Unit half of the patients in this age group had a minor fall risk and one-third had a high fall risk. In the Cardiology Unit, the pa-

Table 1. Sociodemographic Characteristics of Patients in Cardiology and Neurology Units

| General Characteristics | | Cardiology Unit | | Neurology Unit | |
|-------------------------|----------------------|-----------------|------|----------------|------|
| | | n | % | n | % |
| Gender | Female | 38 | 42.2 | 47 | 62.7 |
| | Male | 52 | 57.8 | 28 | 37.3 |
| Age group (in years) | ≥44 | 3 | 3.3 | 24 | 32.0 |
| | 45–59 | 21 | 23.3 | 17 | 22.7 |
| | 60–74 | 41 | 45.6 | 28 | 37.3 |
| | 75–90 | 25 | 27.8 | 6 | 8.0 |
| Place of residence | Town | 67 | 74.4 | 58 | 77.3 |
| | Rural | 23 | 25.6 | 17 | 22.7 |
| Family status | Married | 71 | 78.9 | 51 | 68.0 |
| | Single | 3 | 3.3 | 8 | 10.7 |
| | Widower | 11 | 12.2 | 7 | 9.3 |
| | Divorced | 4 | 4.4 | 6 | 8.0 |
| | Lives with a partner | 1 | 1.1 | 3 | 4.0 |
| Education level | Primary | 9 | 10.0 | 1 | 1.3 |
| | Secondary | 47 | 52.2 | 37 | 49.3 |
| | College | 12 | 13.3 | 10 | 13.3 |
| | University | 22 | 24.4 | 27 | 36.0 |

Table 2. Distribution of Patients by Fall Risk Assessment

| Fall risk | Units, n (%) | | Total |
|-----------|--------------|------------|-------------|
| | Cardiology | Neurology | |
| No | 8 (8.9) | 5 (6.7) | 13 (7.9) |
| Minor | 47 (52.2) | 22 (29.3) | 69 (41.8) |
| High | 35 (38.9) | 48 (64.0) | 83 (50.3) |
| Total | 90 (100.0) | 75 (100.0) | 165 (100.0) |

$n=165$, $\chi^2=10.510$, $lfs=2$, $P=0.005$.

tients in the 60–74 year old group had a minor risk (63.4%), and in the Neurology Unit they had a high (78.6%) fall risk. The comparison of fall risks by age groups is presented in Table 3.

Patients' Fall Risk and Nursing Problems

In the Cardiology Unit, 52.2% of the patients used 1–5 medications, 45.6% used more than 5

medications, and 2.2% were free of any medication use. In the Neurology Unit, 60.0% used 1–5 medications, 34.7% used more than 5 medications and 5.3% did not use any medications. Half of the patients with the diagnosis of stable angina had a minor fall risk (50.0%), and 72.7% of the patients with morbus ischaemicus cordis had a minor fall risk as well. The majority of the patients with heart failure (66.7%) had a high risk of falls.

In the Neurology Unit, the patients diagnosed with stroke (75.5%), Parkinson's diseases (83.3%), and multiple sclerosis (77.8%), and all the patients (100.0%) diagnosed with polyneuropathy and myelopathy had a high fall risk.

Nursing problems, such as mobility impairment, sleep problems, fear of falling, and nocturia, were significantly related to the level of the fall risk in the patients in both medical units ($P<0.05$). All the patients who had no risk of falls walked without assistance. In the Cardiology Unit, more than half (54.3%) of the patients who had a high risk of falls

Table 3. Comparison of the Patients' Fall Risk by Unit and Age Group

| Fall risk | Unit / Age Group (years), n (%) | | | | | | | |
|-----------|---------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Cardiology | | | | Neurology | | | |
| | ≤44 | 45–59 | 60–74 | 75–90 | ≤44 | 45–59 | 60–74 | 75–90 |
| No | 3 (100.0) | 3 (14.3) | 2 (4.9) | – | 3 (12.5) | 1 (5.9) | 1 (3.6) | – |
| Minor | – | 11 (52.4) | 26 (63.4) | 10 (40.0) | 12 (50.0) | 5 (29.4) | 5 (17.9) | – |
| High | – | 7 (33.3) | 13 (31.7) | 15 (60.0) | 9 (37.5) | 11 (64.7) | 22 (78.6) | 6 (100.0) |

$n=165$, $\chi^2=15.292$, $lfs=6$, $P=0.018$.

Table 4. Distribution of Patients by Fall Risk and Nursing Problems

| Nursing Problems | | Unit/Fall Risk, n (%) | | | | | | P | |
|--|-----------------------------|-----------------------|----------------|-----------------|----------------|-----------------|----------------|---------------------------------------|---------------------------------------|
| | | No | | Minor | | High | | | |
| | | Cardio- logy | Neuro- logy | Cardio- logy | Neuro- logy | Cardio- logy | Neuro- logy | | |
| Mobility impairment | Walk without assistance | 8 (100.0) | 5 (100.0) | 44 (93.6) | 22 (100.0) | 12 (34.3) | 21 (43.8) | $\chi^2=61.101$, df=8, P=0.001 | |
| | Walk with stick or crutch | – | – | 1(2.1) | – | 19 (54.3) | 12 (25.1) | | |
| | Walk with walker | – | – | – | – | – | 4 (8.3) | | |
| | Need assistance but refuses | – | – | 2(4.3) | – | 4 (11.4) | 11 (2.9) | | |
| Sleep problems | Yes | 3 (37.5) | 3 (60.0) | 12 (25.5) | 11 (50.0) | 20 (57.1) | 27 (56.3) | $\chi^2=8.228$, df=2, P=0.016 | |
| | No | 5 (62.5) | 2(40.0) | 35 (74.5) | 11 (50.0) | 15 (42.9) | 21 (43.8) | | |
| Fear of fall | Frequent | 2 (25.0) | – | 4 (8.5) | 2 (9.1) | 13 (37.1) | 19 (39.6) | $\chi^2=23.919$, df=4, P=0.001 | |
| | Sometimes | – | – | 10 (21.3) | 8 (36.4) | 9 (25.7) | 7 (14.6) | | |
| | No | 6 (75.0) | 5 (100.0) | 33 (70.2) | 12 (54.5) | 13 (37.1) | 22 (45.8) | | |
| Pain | Yes | 4 (50.0) | 4 (80.0) | 27 (57.4) | 10 (45.5) | 18 (51.4) | 32 (66.7) | $\chi^2=0.766$, df=2, P=0.682 | |
| | No | 4 (50.0) | 1 (20.0) | 20 (42.6) | 12 (54.5) | 17 (48.6) | 16 (33.3) | | |
| Im- paired urinary elimina- tion | Frequent urination | Yes | – | – | 4 (8.5) | – | 1 (2.9) | 9 (18.8) | $\chi^2=3.204$, df=2, P=0.201 |
| | | No | 8 (100.0) | 5 (100.0) | 43 (91.5) | 22 (100.0) | 34 (97.1) | 39 (81.3) | |
| | Nocturia | Yes | 1 (12.5) | 2 (40.0) | 23 (48.9) | 5 (22.7) | 21 (60.0) | 33 (68.8) | $\chi^2=13.610$, df=2, P=0.001 |
| | | No | 7 (87.5) | 3 (60.0) | 24 (51.1) | 17 (77.3) | 14 (40.0) | 15 (31.3) | |
| | Painful urination | Yes | – | – | 5 (10.6) | – | 3 (8.6) | 5 (10.4) | $\chi^2=1.504$, df=2, P=0.471 |
| | | No | 8 (100.0) | 5 (100.0) | 42 (89.4) | 22 (100.0) | 32 (91.4) | 43 (89.6) | |
| | Urinary in- continence | Yes | – | – | 3 (6.4) | – | 4 (11.4) | 6 (12.5) | $\chi^2=4.285$, df=2, P=0.117 |
| | | No | 8 (100.0) | 5 (100.0) | 44 (93.6) | 22 (100.0) | 31 (88.6) | 42 (87.5) | |
| | Other disorders | Yes | – | – | – | – | 4 (11.4) | – | $\chi^2=4.050$, df=2, P=0.132 |
| | | No | 8 (100.0) | 5 (100.0) | 47 (100.0) | 22 (100.0) | 31(88.6) | 48 (100.0) | |

walked with a stick or a crutch. Sleep problems were present in every second patient with a high risk of falls at both units. The majority of the patients without the risk of falls had no fear of falling (75.5% in the Cardiology Unit and 100.0% in the Neurology Unit). The patients who had a high risk of falls in both units more frequently had impaired urinary elimination nocturia ($P=0.001$). The patients with a high risk of falls usually had more nursing problems. Patients' distribution by the fall risk and nursing problems is presented in Table 4.

Discussion

Nurses play an important role in ensuring quality and patient safety in health care by spending the greatest amount of time with patients, monitoring

risks, and improving patient outcomes. While nurses may influence numerous clinical processes and outcomes, fall and injury prevention as nurse sensitive measures reveals as an exemplar framework for demonstrating safe, quality care at the organization, unit, and patient level. The role of nursing in using high reliability support measures for safe patient care in relation to fall prevention and fall injury prevention include a strategy for the implementation of evidence-based practice (14).

Normally, falls risk assessment tools are regularly used in daily nursing practice to identify the risk factors for each inpatient aged 65 years or over, in order to determine the most appropriate care plan for fall prevention and to maximize patient mobility and independence (17). In our study, we assessed

the fall risk of patients, but there was no nursing documentation about falls in clinical practice in the current hospital. Regular fall assessment was also not present in study units despite the fact that even younger patients with neurological diseases had a high risk of falls.

Our study showed that patients with a high risk of falls had more nursing problems. In this study, patients with gait problems had a high risk of falls. These results correspond with those obtained in the study by Verghese et al. (2010) where older adults with neurological gaits at baseline had a 49% increased risk of falls compared with subjects without neurological gaits (18). That is because older adults with Parkinsonian gaits have small shuffling steps, flexed posture, absent arm swing, en bloc turns, and festination. Patients with neuropathic gaits have unilateral or bilateral foot drop with associated signs such as sensory loss and depressed or absent deep tendon reflexes. Presence of neurological gaits diagnosed on routine clinical examination is a strong predictor of a future fall risk.

Fear of falls is considered as post-fall syndrome (19). Fear of falling has been reported by about half of older adults living in community (20, 21). In this study, the majority of the patients with a high risk of falls had fear of falls in both medical units. This fear could be associated with experience of falls and their consequences. A further study is necessary to explore the reasons of patients' fear of falls, especially in a neurology unit.

Nocturia is one of the fall risk factors; our patients with nocturia had a high fall risks in both units. The results of another study support the notion that repeatedly arising from bed, perhaps in a sleepy state, walking to the bathroom in a dark or dimly lit room may be amongst the contributors that should be included in a multi-component program of patient safety environment and fall prevention (22). It is also a danger that nocturia could result in daytime falls due to sleep deprivation that can occur from multiple nighttime awakenings.

Staff in hospitals have a complex and potentially conflicting set of goals when treating patients. They need to treat the problem that prompted the patient's admission, keep the patient safe, and help the patient to maintain or recover physical and mental function. Fall prevention involves man-

aging a patient's underlying fall risk factors (e.g., problems with walking and transfers, confusion, medication side effects, frequent toileting needs) and optimizing the hospital's physical design and environment (2).

Human resources in hospitals play an important role in nursing management. Missed nursing care has also been found to mediate the relationship between staffing levels and falls (23). Thus, staff administration, working hours, and leadership could be important factors for patients' fall prevention management.

Evidence for the most successful fall prevention programs suggests multifactorial and interdisciplinary components (24). Strategies aimed at prevention of patient's falls in hospital have included identification wristbands identifying the high fall risk, greater vigilance through hourly or scheduled rounds, camera monitoring, and use of alarms (23). Fall prevention programs in hospitals have to include a broad approach including fall definition, management, environment, risk factors, documentation, education, assessment and evaluation and have to be incorporated in a general patient safety improving goal (25).

The study has limitations as it was conducted only in two medical units, and the sample size was collected only in a few months. However, it is not possible to compare the patients' fall risk in all units from documentation due to a lack of such kind of information. Proper fall risk documentation could be useful to nurses in clinical practise.

Conclusions

Fall risk assessment of hospitalized patients in medical units remains an important aspect of nursing care. A high risk of falls has been revealed to be a problem not only for older adults but also for younger patients, especially in a neurology unit. A fall risk problem must be one of the most important nursing problems especially in a neurology unit. Patients with a high risk of falls usually have more nursing problems; thus, assessment and management of the fall risk must be integrated in nursing care planning and implementation.

Statement of Conflict of Interest

The authors state no conflict of interest.

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