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Prevention of patient falls in hospitals in the Czech Republic

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Abstract

THEORY: The prevention of patient falls is one of the safety goals set forth by the Ministry of Health of the Czech Republic.
GOAL: A sociological survey was carried out to (1) determine to what extent nurses identify the risk of patient falls at admission, (2) if the risk is reassessed and at what intervals, (3) what preventive measures were taken, and (4) in what way are patient falls reported.
METHODOLOGY: A representative sample consisting of general nurses working shifts on inpatient wards at hospitals in the Czech Republic was surveyed. Altogether 772 nurses took part in the study.
RESULTS: The survey showed that at admission, most nurses assessed the risk of falls (91.6%). Nonetheless, it should stand as a stark warning that nearly one fifth of the respondents (16.2%) did not reassess the risk of falls after admission! On the other hand, it can be perceived as a positive that most nurses (70.1%) use a multifaceted program of preventive measures for at risk patients and immediately reported fall events to the doctor in charge (71.4%). During statistical testing, the predication that a working atmosphere supporting a culture of patient safety would significantly decrease the probability of patient falls and increases the willingness of nurses to use preventive programs in daily practice.
CONCLUSION: Results from the survey showed that a system to minimalize fall risks has been successfully introduced into the hospitals of the Czech Republic. The system is based on the recommendations of the Ministry of Health of the Czech Republic.

ORIGINAL ARTICLE

INTRODUCTION

Patient falls rank among the most common hospital adverse events and are regarded as an indicator of the quality of nursing care (Weiserbs and Hahn 2014). A central focus of nursing care is on patient safety and protection (Feng *et al.* 2008). Falls of elderly persons has the potential to increase the number of patients in the health care system, social care system, and home care settings (Stenvall *et al.* 2006). With regard to demographic trends, the importance of patient safety and fall prevention has increased (Hauer *et al.* 2006). The risk of falls increases with age and is greatest in those ≥65 years old. For the elderly, falls represent a very serious prognosis and a significant symptom

of fragility in old age (Ahmed *et al.* 2007). Falls often complicate treatments, particularly in the elderly – falls can lead to injuries, prolong treatment, and complicate underlying diseases (Binder 2002). Care providers in the Czech Republic have been monitoring the occurrence of accidental falls since 2002 (Svobodová and Jurásková 2010). The Czech Republic records about 650 falls per 1000 inhabitants (Weber *et al.* 2000, p. 71). According to the American Geriatrics Society 2015, fall frequency in patients older than 65 years, hospitalized in emergency and chronic care departments, is nearly three times higher than in the elderly population living in community settings. Approximately one third of the 700,000 to one million falls, which occur in US hospitals every year, could be prevented (Cameron *et al.* 2010). Risk screening provides basic information for determining which interventions are needed for effective prevention (Ackroyd-Stolarz *et al.* 2009; Dykes *et al.* 2010). The causes of falls are mostly multi-factorial; however, their number can be decreased by preventive programs (Krauss *et al.* 2005). To prevent falls, it is important to identify at-risk patients immediately after admission to a health care facility and to determine which preventive measures are compatible with the knowledge of the nursing staff (Gray-Micelli and Quigley 2012). Nurses play a key role with regard to patient safety (Häggqvist *et al.* 2012). Nursing interventions concerning the risk of falls includes assessment and identification of fall-risk at admission, periodic risk reassessment during hospitalization and introduction of preventive measures (Brosey and March 2015). Side effects of pharmacotherapy can lead to falls at any age, but can be a particular issue for the elderly. The relationship between medications and falls has been established (Hartikainen *et al.* 2007). Pharmacotherapy is, according to Smith (2007), the fifth most common cause of falls in the elderly. A close connection has been found between falls and the use of benzodiazepines and between falls and pharmacotherapy involving four or more drugs. Pharmacotherapy can increase fall-risk by 2.5 times and, in combination with other risk factors, may increase the risk by 28 times. Risk medications for geriatric therapy are those that have a high potential to interact with other drugs, have a narrow therapeutic window or have a tendency to accumulate in those with reduced kidney or liver function (Weber and Ambrošová 2011). In accordance with empirical results, antidepressives, anxiolytics, hypnotics, and sedatives positively correlate with injury occurrence rates (Bauer *et al.* 2012). The knowledge and experience of nurses in this particular area are of great importance with regard to reducing the risk of falls in patients (Ndosi and Newell 2008; Lindsay 2009).

As the introduction of the program to prevent patient falls represents one of the safety goals of the Ministry of Health of the Czech Republic (2011), the study was focused on ways of putting the essential principles of the fall prevention into practice.

The following **partial goals** were set in accordance with the topic of the survey:

1. To find out whether nurses perform fall-risk assessments at patient admission.
2. To determine the frequency of fall-risk reassessments during hospitalization.
3. To describe preventive measures use to reduce fall the risk for at-risk patients.
4. To evaluate the way falls are reported.
5. To evaluate the influence of a "safety culture" on falls occurrence rates and the willingness of nurses to use fall prevention programs in daily practice.

MATERIALS AND METHODS

The opinions of general nurses were identified using controlled dialogues. Information was collected using the INRES polling agency. The data was analyzed using SASD 1.4.10 and SPSS 16.1 statistical software. The degree of dependence between selected features was determined using the chi-square and other tests. Statistical significance was set at $p = 0.05$. The study sample consisted of general nurses working shifts on inpatient wards in hospitals in the Czech Republic. The sample consisted of 772 general nurses. During the survey, which took place during the latter half of 2013, nurses from all regions of the Czech Republic were surveyed (ÚZIS 2013).

RESULTS

Fall prevention during hospitalization ranks as one of the central pillars of safe care for patients. Our study of fall prevention was based on four items. Survey questions were focused on the assessment and identification of fall-risk during patient admission and periodic reassessment during hospitalization. Additionally, we evaluated the spectrum of preventive measures used for at-risk patients and what procedures were used by nurses relative to fall management.

Question 1 *(Do you assess the fall-risk for each patient at admission?)* explored whether nurses assessed the fall-risk during the patient initial examination.

The majority of nurses (91.6%) indicated that they assessed the risk of falls in all patients. Less than one tenth of the respondents (8.3%) reported that they did not perform a fall assessment during admission.

Fall-risk assessments at admission were found to be much more common at university hospitals and significantly less common in regional hospitals. The chi-square test (χ^2) based on classification of hospital type, had a value of 13.405 with 4 degrees of freedom, $P < 0.01$.

Question 2 *(Do you reassess patient fall-risk at regular intervals?)*; identified whether nurses reassessed the fall risk in hospitalized patients at regular intervals. Less than a half of nurses reported that they reassessed

fall-risk at regular (weekly) intervals. Approximately one third of respondents perform a reassessment after changes in medication and 16.2% respondents reported never reassessing fall-risk in patients during hospitalization.

Fall-risks were significantly under assessed at private hospitals. Respondents from regional hospitals reported that they only reassessed when there were medication changes that could cause dizziness. The chi-square independence test (χ^2) for hospital type was 23.333 with 12 degrees of freedom, $P < 0.05$. Regular reassessment of fall-risk tended to be less frequent in intensive care units. The chi-square independence test (χ^2) for classification by wards was 20.065 with 9 degrees of freedom, $P < 0.05$. No other significant deviations were identified.

In association with the fall-risks, our study also investigated what preventive measures were introduced for patients at risk of falls. The question read as follows *What interventions were used for patients at risk of a fall?*.

The majority of nurses (70.1%) reported that in patients at risk of falling, a multifaceted intervention program was instigated including adding the information to patient documentation, noting "fall-risk" on patient ID wristbands, educating patients regarding fall-risk, and the use of suitable support equipment or modifying patient environments to increase safety. 28.6% nurses reported that for patients at risk of falling, the risk was noted in patient documentation and on ID wristbands. Only 0.1% nurses reported that fall-risk was not address in any way.

Statistically significant differences in the answers were identified only with regard to classification of nurses relative to education level. The nurses with an academic education (Bc., Mgr.) reported using multifaceted preventive intervention programs for at-risk patients more frequently than others. Nurses with higher levels of professional education, reported more frequent use of easily visible marks on ID wristbands followed notes in patient documentation, compare to nurses with other levels of education. The chi-square independence test (χ^2) for classification by education was 20.308 with 6 degrees of freedom, $P < 0.01$.

Our study of fall prevention also included reporting of patient falls. The question read as follows *"How do you report patient falls?."*

Most nurses (71.4%) reported that they immediately inform a doctor who took proper steps. About one fifth of nurses (18.8%) reported patient falls to the supervising ward nurse. A few nurses (6.0%) reported waiting until the next ward rounds to announce the fall.

The issue of 'What to do next?' after a patient fall was also influenced by nurse education levels. Nurses with higher levels of professional education reported statistically more frequently that they reported the incident to the ward nurse and tried to resolve the problem together with him/her, while nurses with secondary educations reported significantly more frequently that they informed the supervising doctor. The chi-square independence test (χ^2) was 18.713 with 9 degrees of freedom, $P < 0.05$. Nurses with a specialization tended to resolve the situation together with the ward nurse. The chi-square independence test (χ^2) was 8.652 with 3 degrees of freedom, $P < 0.05$.

With regard to statistical testing, our focus was on confirmation of the prediction that promotion of a 'safety culture' in hospitals would significantly decrease the probability of falls and increased the willingness of nurses to use fall prevention programs. To assess the degree of linearity, the Pearson's linear correlation coefficient was chosen, which has values from (–1 to +1). The higher the absolute value, the stronger the relationship between variables. The correlation matrix between paired variables *fall probability* and *safety culture* (Table 1), showed a significant *negative correlation*. This indicates that, in the opinion of nurses, the risk of patient falls decreases in the presence of a strong 'safety culture' on the ward. A *positive correlation* was found between the entrance assessment and reassessments of the risk of patient falls, thanks to the introduction of preventive measures. This indicates that if the hospital work environment promotes patient safety, intervention programs to prevent falls were statistically more likely to have been introduced and be in place. It is interesting that there was no statistically significant relationship between work atmosphere supporting patient safety and nurse willingness to report falls ($P = 0.776$).

DISCUSSION

Every year a large numbers of people are injured as a result of falls. Falls represent a risk for patients both in home care and in hospital settings. Patients most at-risk are patients in the acute phase of their disease, convalescents, and particularly fragile elderly patients (Topinková 2005). The reasons are varied. Falls can be caused by an improper environment: a slippery floor, insufficient illumination, etc. A patient weakened by disease can suffer from disorientation, dehydration, dizziness, or hypotension, all of which can be risk factors that increase fall probabilities (Smith 2007). According to the safety goal of the Ministry of Health of the Czech Republic (2011), health care providers introduced a unified approach for prevention and management of patient falls. Our survey was focused on assessing the success of the basic principles of the recommendation of the Ministry of Health of the Czech Republic in clinical practice.

The entrance assessment of fall-risk is a necessary first-step in any program to decrease the fall-risk of inpatients. Screening identifies individual fall-risk factors that can cause falls and these factors should be minimized by the nursing staff during patient

Tab. 1. Relationship between aspects of patient fall prevention and promotion of a 'safety culture' within hospitals

Relation of the variables	Working atmosphere supports the patient safety		
	Pearson correlation	Sig. (2-tailed)	*N*
Fall probability	**–0.205**	0.000	761
Entrance assessment of fall-risk	**0.105**	0.003	770
Fall reassessments (regularity of)	**0.086**	0.020	728
Application of preventive measures	**0.146**	0.000	770
Reporting of falls	–	0.776	765

hospitalization (Aranda-Gallardo *et al.* 2013). While assessing fall-risks, nurses should also identify potential reasons and consequences of falls, such as injuries and the patient fear of another fall. Visual and cognitive disorders or problems with incontinence should also be assessed. Furthermore, gait stability, balance, mobility, and muscular weakness should be assessed. Other fall indicators include health condition assessment for osteoporosis, assessment of functional abilities, information regarding long-term medication use, assessment of footwear suitability, etc. According to the recommendations of the Ministry of the Czech Republic (2011), hospitals should define procedures for patient fall assessment in their internal rules, regulations, and guidelines. Hospital management defines, by means of the internal regulation, in which patients and in what range, fall-risk screening will be assessed. In our sample, fall-risk was assessed for each patient at admission by the majority of nurses (91.6%). Results suggest that an admission fall-risk assessment was a standard procedure, which represents a good example of effective clinical care.

An alternative to screening based on standardized protocols is a clinical risk assessment carried out by health care workers based on their experience (Myers and Nikoletti 2003; Vassallo *et al.* 2008). The success of this assessment depends on the knowledge, experience, and skills of the health care staff (Häggqvist *et al.* 2012).

Many things can lead to falls, which makes their diagnosis, treatment, and prevention a difficult clinical problem. Falls can present as the first symptom of an acute disease, such as an infection, postural hypotension, or cardiac arrhythmias. They can also be caused by chronic diseases, such as Parkinson disease, dementia, osteoporosis, or diabetic neuropathy. Falls can also occur as a result of natural physiological and biological changes that occur in the course of ageing. These changes include impaired sight, gait instability, muscle strength, or slowed defensive reflexes, with the latter having the potential to make even a minor fall more serious. Most falls have a multi-factorial character in the elderly (Rubenstein and Josephson 2006). During hospitalization, changes in patient fall-risks can occur as a result of surgery, ocular examination, or changes in the spectrum of medications used for treatment. Therefore, patients should give doctors and nurses complete information about their medication (Brabcová *et al.* 2014) and they should be actively involved in the verification of medications used (Bártlová *et al.* 2014). It is very important for the hospital to set forth procedures for reassessing fall-risks in patients during hospitalization! This reassessment should be repeated regularly, at least once a week, and always at the time of any change in a patient health status, any change in medication, or after anesthesia. Results from our survey showed that fall-risk was reassessed by nurses at regular weekly intervals or if there was a change in health condition or medication. That 16.2% of nurses reported never doing a fall-risk reassessment should stand as a stark warning.

Important steps in any fall prevention program, not only include identification of at-risk patients, but also protocols for preventive measures to protect at-risk patients from falls. Nursing interventions for at-risk patients include placing warning information over the patient's bed or in patient documentation, lowering the bed, lifting the side rails, and locating the patient in rooms nearest the nurses' office and lavatory. Additionally, nursing care plans need to address specific risk factors and interventions (Dykes *et al.* 2010; Kim and Jeonq 2015; Marques *et al.* 2015). Ensuring a suitable hospital setting represents an important aspect of safe care. This means systematic identification and resolution of risk factors in the hospital setting. Risk factors that increase fall-risks include wet floors, insufficient illumination, unsecured furniture, and shortage of hand pulls, antiskid mats, and handrails (Smith 2007). Appropriate risk management must also address practical matters e.g., whether the patient can reach, in the event of a fall, the bell located in the toilet, or whether other signal devices can be reached by a fallen patient. Paradoxically, it is more convenient for some restless patients if the side rails are not raised (or only raised on one side) and the bed is lowered to the lowest possible position. This prevents patients from feeling restricted in their movements and, consequently, reduces the risk of falls if patients try to circumvent the restrictions. It also means that if a fall happens, it is less likely to

result in serious injuries if the patients are not trying to overcome a higher barrier, in the form of a raised side rail. Nevertheless, this measure cannot be applied globally to all restless and confused patients. Nurses play an irreplaceable role because they decide, based on their knowledge, which interventions will be used for a particular patient. Currently, there are 'smart beds' available, which are equipped with warning sensors and can signal patient movement. In high risk patients, hip guards can also be used. Patient education and education of significant others in ways to decrease fall-risks represent a significant aspect in reducing overall fall-risk for a patient (Hook *et al.* 2008).

Our study showed that nurses (particularly nurses with academic educations) choose, on the basis of the patient assessment of risk factors, highly individualized nursing interventions for individual patients to minimize risks and/or reduce the consequences of patient falls.

Another topic of patient fall prevention involves reporting of falls. It is the duty of all employees to report adverse events to their superiors. Fall reporting depends on the nurses' responsibility and also motivation to report and document the incident. Therefore, it was positive to find that almost three quarters of nurses (71.4%) immediately report patient falls to a doctor or supervisor. The results were analyzed, evaluated and, on the basis of this evaluation introduce to health care providers in the form of corrective and preventive measures. The goal of the analysis was to identify risky procedures and define effective preventive measures. Health care facilities that have no experience in monitoring this quality indicator tend to report, to a higher degree, only those falls associated with injuries. Additionally, there is the issue of fear of sanctions associated with reporting a fall to a supervisor. If the hospital management supports the development of a 'safety culture' by asking staff to report adverse events, patient safety increases (Vincent 2010; Vincent and Amalberti 2015). Our survey also revealed a positive correlation between management endorsement of a 'safety culture' and the willingness of nurses to actively participate in fall-risk prevention protocols for hospitalized patients (Table 1). The comparison of the results from individual hospitals was also important. Results from comparisons among Czech hospitals are available through the National System of Reporting Adverse Events (Národní systém hlášení nežádoucích událostí 2011) or Falls (Pády), the project of the Czech Association of Nurses (2008).

CONCLUSION

One of the requirements of the Ministry of Health of the Czech Republic demands that health care institutions introduce a unified procedure for fall prevention and its implementation. The goal of this survey was to assess to what degree this requirement has been met by Czech hospitals. According to the results, it can be reported that the vast majority of nurses complete a fall-risk assessment for each in-patient and deal with this risk during the entire hospitalization period. The survey shows that most nurses deal with at-risk patients using a multifaceted program of preventive measures. When a fall does happen, most nurses immediately reported the adverse event to the doctor in charge.

One part of the preventive program involves the eduction patients and significant others in fall prevention procedures. Patients should be educated on fall-risks that they face during hospitalization. They should be encouraged to be careful and to draw the attention of health care staff to any changes of their health condition or fear of falling. In conclusion, it can be stated that nurses now play a significant role in the implementation of safety goals and consistently and reliably take effective steps to minimize the risk of patient falls in clinical practice. While we have had wonderful success implementing our goals, there remain a few areas where we want to continued improvement. The main concern is the question of reassessments and the analysis of why falls happen. We remain committed to working on these areas until the risk of patient falls in Czech hospitals has been effectively eliminated.

Conflict of interest

The authors report no conflict of interest.

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