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Risk factors associated with falls in adult patients

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ABSTRACT
Accidents caused by falls can have various consequences for patients and identifying the risk factors that contribute to the occurrence of this event is essential for its prevention. Falls are a multifactorial event and it is essential for nurses to assess the risk factors for falls during hospitalization in order to provide individual, qualified care, seeking a safe environment and preventing the occurrence of this adverse event. This study is the result of a literature review on the subject, the aim of which was to analyze the risk factors identified in the literature related to the occurrence of falls in adult patients admitted to clinical-surgical units. Ten articles were found which showed that the main factors identified in the literature were advanced age, changes in physical mobility, post-surgery and the use of potentially dangerous medication.

Keywords: Fall accidents, Patient safety, Hospitalization, Nursing.

1 INTRODUCTION

Patient safety has remained an issue of great concern to healthcare institutions and professionals all over the world in recent decades. In Brazil, the National Patient Safety Program (PNSP) was established in 2013, through Ministerial Order 529 of the Ministry of Health, with the aim of preventing and reducing the incidence of adverse events (AE) related to care in health services and encouraging institutions to develop and implement protocols that guarantee safer care (BRASIL, 2013a; BRASIL, 2013b).

In this perspective, many strategies have been undertaken to guide good practices for reducing risks and adverse events in health services, such as the adoption of the International Patient Safety Goals, established in 2006 by the Joint Commission International (JCI), in partnership with the World

Health Organization (WHO), in which reducing the risk of injury to patients from falls is one of these goals (JOINT COMMISSION INTERNATIONAL, 2014).

A fall is defined as the unintentional displacement of the body to a lower level than the initial position, caused by multifactorial circumstances, resulting or not in damage. Accidents caused by falls can have various physical or psychological consequences for patients, lead to serious injuries, impair their physical mobility and prolong their hospital stay, as well as negatively affecting the health institution involved, increasing care costs and generating ethical and legal implications (BRASIL, 2013c).

In this context, it is essential to identify the risk factors that contribute to falls. These factors can be directly related to the patient, known as intrinsic factors, or they can be associated with the environment, known as extrinsic factors. In view of this, this study's guiding question is: What scientific productions identify as factors associated with falls in adult patients hospitalized in clinical-surgical units?

Considering that falls are a public health problem worldwide and a frequent adverse event in the hospital environment, the hypothesis of this study was that knowing the prevalent risk factors associated with falls is essential to guide care planning and the implementation of preventive measures, thus contributing to reducing the occurrence of the event and to patient safety.

The aim of this study was to analyze the risk factors identified in the literature related to the occurrence of falls in adult patients admitted to clinical-surgical units.

The proposed study aims to help nursing staff reflect on the importance of identifying the risk factors associated with falls and implementing care to prevent them, in order to improve patient care, reduce harm, length of stay and the cost of hospitalization.

This is a literature review. The PICO (Patient, Intervention, Comparison and *Outcomes*) search strategy was used to construct the research problem and organize the articles found. The databases consulted were: Nursing Database (BDENF), Scientific Electronic Library Online (SciELO) and Latin American and Caribbean Literature on Health Sciences (LILACS). The descriptors used in the search, according to DeCs (Bireme Health Descriptors) were: Fall Accidents, Patient Safety, Hospitalization and Nursing. The inclusion criteria were articles that addressed in the title and abstract factors associated with the occurrence of falls in adult patients admitted to clinical and surgical units, available in Portuguese, English or Spanish, with online access to the full text, published between 2015 and 2020 (SANTOS, PIMENTA, NOBRE, 2007).

2 DEVELOPMENT

2.1 CHARACTERIZATION OF THE SAMPLE

Ten articles were selected from the databases consulted, all published in Portuguese, with SciELO having the highest number of published articles (6).

2019 was the year with the highest number of publications on the subject, with 4 articles selected, followed by 3 in 2017 and only one in 2015, 2016 and 2018. There were no publications in 2020 as of the time of this study.

The studies were distributed in Table 1 according to authorship, database consulted, journal published, year of publication and the risk factors for falls identified in the article, organized in ascending order by year of publication.

Table 1 - Selected articles on factors associated with falls in adult patients hospitalized in clinical-surgical units

Authors	COMICS	Journal	Year	Risk Factors
VITOR, A.F. *et al.*	BDENF	Revista Cogitare Enfermagem	2015	> Age over 65 > History of falls > Post-surgery > Use of multiple devices > Impaired physical mobility > Decreased visual acuity > Anemia, dizziness, impaired balance > Vascular diseases > Insomnia > Use of narcotics, opiates, antihypertensives
SILVA, C.F. *et al.*	LILACS	Revista Cogitare Enfermagem	2016	> Age over 65 > History of falls > Change in gait > Decreased visual acuity > Postural hypotension, dizziness, anemia, hypoglycemia > Insomnia > Use of diuretics and psychotropic drugs > Depression and anxiety > Urinary incontinence and urgency
MATA, L.R.F. *et al.*	SCIELO	Latin American Journal of Nursing	2017	> Age over 60 > SAH (use of antihypertensives) > DM (use of hypoglycemic agents) Heart disease > Hypothyroidism
BITTENCOURT, V.L.L. *et al.*	SCIELO	Journal of the USP School of Nursing	2017	> Age over 60 > Post-surgery (orthopedic surgeries) > Decreased visual acuity > Comorbidities (SAH, DM, Parkinson's) > Use of sedative drugs and pain control

VICTOR, M.A.G. *et al.*	BDENF	*UFPE Nursing Journal*	2017	> Age over 65 > Post-surgery > Use of multiple devices > Use of antihypertensives and sedatives > Limitation in walking > Absence of caregiver > Comorbidities (SAH, DM) > Wet / slippery floor
SEVERO, I.M. *et al.*	SCIELO	Latin American Journal of Nursing	2018	> Post-surgery > Limitation in walking > Disorientation and confusion > Number of medications in the last 72 hours > Frequent urination > Absence of caregiver > Prolonged hospitalization
LUZIA, M.F. *et al.*	SCIELO	Gaúcha Journal of Nursing	2019	> Age over 65 > Altered gait, impaired physical mobility > Altered state of consciousness > Use of at least 3 risk medications > Absence of caregiver
XIMENES, M.A.M. *et al.*	LILACS	Brazilian Journal of Health Promotion	2019	> Age over 65 > History of falls > Post-surgery > Use of multiple devices > Difficulty walking, altered gait, reduced strength > Decreased visual acuity > Anemia, Hypotension, Impaired balance > Insomnia > Medicines > Unfamiliarity with the environment > Lack of non-slip material in the bathroom
BARBOSA, A.S. *et al.*	SCIELO	Gaúcha Journal of Nursing	2019	> Age over 60 > History of falls > Post-surgery > Use of multiple devices > Limitation in walking, gait alterations, use of canes and prostheses, reduced strength > Hypotension and dizziness > Disorientation, agitation, insomnia > Use of sedatives/drowsiness > Hypoglycemia > Absence of caregiver > Equipment failure
AGUIAR, J.R. *et al.*	SCIELO	Acta Paulista Enfermagem	2019	> History of falls > Post-surgery > Use of multiple devices > Difficulty walking / impaired physical mobility / Decreased strength > Impaired balance > Little known scenario

				> Lack of non-slip material in the bathroom

Author: LIMA, 2020.

2.2 MAIN FACTORS ASSOCIATED WITH FALLS

Falls in hospitalized patients are a multifactorial adverse event and represent one of the main incidents related to patient safety. The literature review identified various risk factors for the occurrence of falls in clinical-surgical patients, providing some categories of analysis, as described below:

2.2.1 Advanced age

Eight articles (80%) found that advanced age (over 60) is one of the main risk factors for falls (VITOR *et al*, 2015; SILVA et *al*, 2016, MATA et *al,* 2017; BITTENCOURT *et al*, 2017; VICTOR et al, 2017; LUZIA *et al*, 2019; XIMENES *et al*, 2019, BARBOSA et *al*, 2019).

Luzia *et al* (2019) states that fall rates increase with age due to changes related to aging, which is a natural process in which there is a general decline in the physical capacities of individuals. The association of the presence of chronic degenerative diseases, cognitive decline, visual and physical mobility changes and the use of multiple medications makes the elderly more fragile and vulnerable to falls (SILVA, BRASILEIRO, SOUZA, 2018).

2.2.2 Changes in physical mobility

Changes in physical mobility such as difficulty walking, changes in gait, reduced strength or the use of walking aids such as canes were found in 70% of the articles selected (VITOR *et al*, 2015; SILVA et *al*, 2016; VICTOR *et al,* 2017; SEVERO *et al,* 2018; LUZIA, *et al* 2019, XIMENES, et al, 2019, BARBOSA *et* al, 2019).

Barbosa *et al* (2019) found that limitation in walking was present in 54.3% of falls reported at a university hospital in the south of the country. In addition, Ximenes *et al* (2019) found that, among patients diagnosed as being at risk of falls, 51% had impaired physical mobility and 56.7% had difficulty walking. A study carried out in an American hospital corroborates this data, which found that 47% of patients with falls had gait alterations, and 34% used some kind of device to help them walk (GUILLAUME, CRAWFORD, QUIGLEY, 2016).

2.2.3 Post-operative state and use of multiple auxiliary devices

According to NANDA I (2013) one of the physiological factors for the risk of falls is the conditions following the surgical intervention. The postoperative period was classified as one of the predictive factors for a high risk of falls, cited in 7 of the 10 articles selected, since the patient may

still be under the effects of anesthetics and other medications, with difficulties in mobilizing, the presence of pain, in addition to the use of drains, venous accesses and probes, leading to greater vulnerability due to the surgery performed (VITOR *et al*, 2015; BITTENCOURT *et al*, 2017; VICTOR et *al*, 2017; SEVERO et *al,* 2018; XIMENES *et al,* 2019; BARBOSA *et al,* 2019; AGUIAR *et al, 2019*).

Vitor *et al* (2015) found that 83.8% of postoperative patients had a diagnosis of risk of falls and Bittencourt *et al* (2017) stated that the surgical procedure increases the risk of falls because it affects the patient's mobility and memory due to the use of sedative and pain-control medications.

In addition, the use of multiple hospital devices, often found in postoperative patients, was listed in 50% of the articles in this study (VITOR *et al*, 2015; VICTOR et *al*, 2017; XIMENES *et al,* 2019; BARBOSA et *al*, 2019; AGUIAR *et al, 2019*). Victor *et al* (2017) reports that the presence of probes and drains in surgical patients can hinder their mobility, not only because they have to carry them during locomotion, but also because of the restriction of movement they can cause.

2.2.4 Use of potentially dangerous medicines

The use of some potentially dangerous drugs for the fall event or the combination of multiple drugs were identified in 90% of the articles in this review (VITOR *et al*, 2015; SILVA et *al*, 2016; MATA et *al,* 2017; BITTENCOURT et *al, 2017;* VICTOR et al, 2017; SEVERO *et al,* 2018; LUZIA et al, 2019; XIMENES *et al,* 2019; BARBOSA et *al, 2019*).

Severo *et al* (2018) considered polypharmacy and the relationship with multiple comorbidities a relevant factor for the risk of falls, highlighting the number of drugs administered from certain classes in the last 72 hours, namely: benzodiazepines, opioids, barbiturates, antipsychotics, antidepressants, antihypertensives, laxatives, diuretics, antihistamines, anticonvulsants and sedatives. He pointed out that the combination of different medications can produce or potentiate clinical conditions such as hypotension, confusion, dizziness, attention deficits, drowsiness and others.

Mata *et al* (2017), Bittencourt *et al (2017)* and Victor *et al* (2017) highlighted systemic arterial hypertension (SAH) as the main comorbidity associated with the risk of falls in their studies. In addition, Barbosa *et al* (2019) reported that the use of antihypertensive drugs and postural hypotension can cause dizziness and loss of consciousness, resulting in falls.

The use of diuretics and laxatives is related to urinary and intestinal urgency/incontinence. Silva *et al* (2016) stated that urinary urgency increases the risk of patients falling due to the greater chance of trying to get out of bed. Severo *et al* (2018) corroborates this by stating that altered urinary and/or intestinal elimination leads to a more frequent need to go to the bathroom, exposing patients to a greater risk of falls.

The results of the study by Vitor *et al* (2015) showed that more than 50% of post-operative patients were taking narcotics and/or opioids. Opioids, often used to control pain, can increase the risk of falls due to their potential to depress the central nervous system (Severo at all, 2014).

Benzodiazepines can promote side effects such as: sleep disorders, seizures, drowsiness, sedation and lethargy, and can cause distorted vision, transient postural hypotension, in addition to their rebound effect of insomnia when used for a long time, conditions that favor the risk of falls (MARQUES, NICOLA, OLIVEIRA, 2016).

2.2.5 Decreased visual acuity

Decreased visual acuity was found to be a risk factor for falls in 40% of the articles in this review (VITOR *et al*, 2015; SILVA et *al*, 2016; BITTENCOURT *et al*, 2017; XIMENES *et al,* 2019).

Bittencourt *et al* (2017) showed in their study that visual impairment had significant relevance as a predictive factor for falls and Silva *et al* (2016) reported that 100% of patients with a fall outcome had impaired vision.

Another study that aimed to analyze the risk factors for falls in the first 48 hours of hospitalization and associate them with the occurrence of falls reported that 88.6% of patients who fell had visual impairment (REMOR, CRUZ, URBANETTO, 2014).

2.2.6 History of falls

A history of previous falls is a relevant factor in assessing the risk of the event occurring and was highlighted in 5 of the 10 articles selected (VITOR *et al,* 2015; SILVA et *al*, 2016; XIMENES *et al,* 2019; BARBOSA *et al*, 2019; AGUIAR *et al, 2019*).

An American study pointed out that patients with a history of falls are 2.98 times more likely to suffer a new event (MOE at all, 2015).

Silva *et al* (2016) found that 60% of patients who fell had a previous history of falls, while Ximenes *et al* (2019) found that almost 28% of patients with a nursing diagnosis of risk of falls had a history of falls.

2.2.7 Absence of a companion

The absence of a companion is one of the extrinsic factors that contributes to the occurrence of falls, reported in 40% of the studies that make up this review (VICTOR *et al,* 2017; SEVERO *et al,* 2018; LUZIA *et al,* 2019; BARBOSA et *al, 2019*).

Barbosa *et al* (2019) found that in 65.9% of the reports of falls, patients were without companions at the time of the event. Prates *et al* (2014) corroborates this with their study in which they found that only 29.2% of falls were reported with a companion present.

Patients often hesitate to ask for help from the nursing staff to get out of bed, overestimating their physical capacity and/or out of embarrassment, especially at night. In addition, the nursing team is not always present due to the number of patients assigned to it, so the companion is an important element in helping the patient with their mobility, and thus in preventing falls (PRATES at all, 2014).

2.2.8 Unfavorable environment

Another extrinsic factor that can increase the risk of falls is the environment, mentioned in 30% of the articles (VICTOR *et al*, 2017; XIMENES *et al*, 2019; AGUIAR *et al,* 2019).

Aguiar *et al* (2019) and Ximenes *et al* (2019) reported that the unfamiliar setting and insufficient non-slip material in the bathroom are among the main environmental risk factors related to the risk of falls.

A study carried out in a medical and surgical inpatient unit at a university hospital in the interior of Paraná found that none of the rooms had non-slip floors. In addition, the water drainage in the bathroom/box was inadequate, keeping these environments constantly wet and, to minimize this problem, they used cloths and rugs on the floor, which further increases the risk of falls (MARQUES, NICOLA, OLIVEIRA, 2016).

In this context, nurses must act to prevent falls in hospitalized patients, identifying intrinsic risk factors related to the patient, together with extrinsic factors related to the environment and the work process, implementing preventive interventions to prevent the adverse event from occurring, reassessing the risk when there is any change in the patient's clinical condition and adjusting the measures if necessary (SEVERO *et al*, 2014; BRASIL, 2013c).

In addition, applying visual signage for patients at risk of falls and providing guidance to healthcare professionals, as well as patients and their companions, are important measures recommended by the PNSP. The education of patients and the professionals who will assist them should be carried out as soon as the risk is identified and reinforced throughout hospitalization (BRASIL, 2013c; LUZIA *et al*, 2018).

3 CONCLUSION

The results of this study showed that falls are a multifactorial adverse event, which mainly affect patients of advanced age, with altered physical mobility, in the post-operative period, using multiple assistive devices and potentially dangerous medication, with reduced visual acuity, a history of falls and altered mental state, as well as environmental factors that influence the occurrence of the event.

It is important to consider that hospitalization itself increases patients' risk of falls due to the change in their familiar environment, especially for those with sensory alterations, such as low visual

acuity, or impaired physical mobility, which can aggravate injuries resulting from falls, should they occur, and the patient's clinical condition.

In view of this, it is essential for nurses to assess the risk factors for falls during hospitalization, in order to support individual, qualified care, seeking a safe environment and preventing the occurrence of this adverse event.

The limitation of this study was the small number of articles on the subject focusing on the adult population, since there are several publications focusing only on the relationship between falls and the elderly.

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