

# Characterization of patient falls according to the notification in adverse event reports

CARACTERIZAÇÃO DAS QUEDAS DE PACIENTES SEGUNDO NOTIFICAÇÃO EM BOLETINS DE EVENTOS ADVERSOS

CARACTERIZACIÓN DE LAS CAÍDAS DE PACIENTES DE ACUERDO A LAS NOTIFICACIONES EN BOLETINES DE EVENTOS ADVERSOS

Miriam Cristina Marques da Silva de Paiva<sup>1</sup>, Sergio Alberto Rupp de Paiva<sup>2</sup>, Heloisa Wey Berti<sup>3</sup>, Álvaro Oscar Campana<sup>4</sup>

## ABSTRACT

The objective of this study was to observe the characteristics of falls occurring in the inpatient population at a tertiary hospital. Eight hundred and twenty-six Adverse Events Notification Reports were analyzed over a 30 months period, and 0.30 falls per 1,000 patients/day were reported. Falls from beds were the most frequent (55%), showing the highest occurrence in the neurology ward. A higher frequency of falls was observed at night time (63.7%), during the first five hospitalization days (61.7%), in male patients (57.5%) over 60 years old (50%). In cases of falls from a bed, the diagnoses were related to infectious and parasitic diseases (18.2%), diseases affecting the nervous system (18.2%) and those affecting the circulatory system (13.7%). In cases of falls from one's own height, they were related to neoplasms (19.4%) and diseases affecting the genitourinary system (16.1%). It is concluded that high importance should be placed on studying the population to characterize those at high risk for falls to assist in the implementation of preventive measures.

## KEY WORDS

Nursing care.  
Accidental falls.  
Hospital administration.  
Health care quality indicators.

## RESUMO

Este estudo foi desenvolvido com o objetivo de caracterizar as quedas de pacientes internados ocorridas em hospital terciário. Foram analisados 826 Boletins de Notificação de Eventos Adversos, de um período de 30 meses, que registraram 0,30 quedas por 1000 pacientes/dia. Quedas do leito foram mais frequentes (55%), com maior prevalência na enfermaria de neurologia. Maior frequência de quedas foi verificada no período noturno (63,7%), nos primeiros cinco dias da admissão (61,7%), nos pacientes de sexo masculino (57,5%) e na faixa etária maior de 60 anos (50%). Nos casos de quedas do leito, os diagnósticos relacionaram-se a doenças infecciosas e parasitárias (18,2%), doenças do sistema nervoso (18,2%) e doenças do aparelho circulatório (13,7%). Nas quedas da própria altura, os diagnósticos relacionaram-se a neoplasias (19,4%) e doenças do aparelho geniturinário (16,1%). A caracterização desses eventos adversos auxilia no reconhecimento dos grupos de maior risco e na elaboração de propostas preventivas.

## DESCRIPTORIOS

Cuidados de enfermagem.  
Acidentes por quedas.  
Administração hospitalar.  
Indicadores de qualidade em assistência à saúde.

## RESUMEN

Esta investigación fue desarrollada con el objetivo de verificar las características de las caídas sufridas por pacientes internados en un hospital privado. Fueron analizados 826 Boletines de Notificación de Eventos Adversos, en un período de 30 meses. Fueron registradas 0,30 caídas por cada 1000 pacientes/día. Las caídas de la cama fueron las más frecuentes (55%), con mayor prevalencia en la Enfermería de Neurología. Se verificó una mayor frecuencia de caídas en el período nocturno (63,7%), durante los primeros cinco días de admisión (61,7%), en los pacientes de sexo masculino (57,5%) y en la faja etaria de mayores de 60 años (50%). En los casos de caídas de la cama, los diagnósticos se relacionaban con enfermedades infecciosas y parasitarias (18,2%), enfermedades del sistema nervioso (18,2%) y enfermedades del aparato circulatorio (13,7%). En las caídas directas del cuerpo, se encontró relación con las neoplasias (19,4%) y enfermedades del aparato genitourinario (16,1%). La caracterización de esos eventos adversos coadyuva en el reconocimiento de los grupos de mayor riesgo y en la elaboración de propuestas de carácter preventivo.

## DESCRIPTORIOS

Atención de enfermería.  
Accidentes por caídas.  
Administración hospitalaria.  
Indicadores de calidad en asistencia a la salud.

<sup>1</sup>RN. MSc in Nursing at Botucatu Medical School, Universidade Estadual Paulista "Júlio de Mesquita Filho". Botucatu, SP, Brazil. miriampaiva@fmb.unesp.br  
<sup>2</sup>Adjunct Professor at Medical Clinic Department of Botucatu Medical School, Universidade Estadual Paulista "Júlio de Mesquita Filho". Botucatu, SP, Brazil. paiva@fmb.unesp.br  
<sup>3</sup>PhD, Faculty at Nursing Department of Botucatu Medical School, Universidade Estadual Paulista "Júlio de Mesquita Filho". Botucatu, SP, Brazil. weybe@fmb.unesp.br  
<sup>4</sup>Emeritus Professor at Botucatu Medical School, Universidade Estadual Paulista "Júlio de Mesquita Filho". Botucatu, SP, Brazil. alvaroc@fmb.unesp.br

## INTRODUCTION

Information is extremely important for adequate management, cost reduction and error prevention in the hospital environment. Some indicators, constructed based on nursing care delivery data, are information used to monitor and assess the quality of this care service. Examples of indicators are adverse events related to pressure ulcer frequency, hospital infection, catheter handling problems and patient falls.

In this paper, a broader definition of adverse event will be used: unintentional inconvenience provoked by the health team that may or may not include increased hospitalization or disability time<sup>(1)</sup>. The existence of adverse events that jeopardize patient safety, such as falls, represents a great challenge to improve health care quality nowadays.

Fall is defined as an unplanned event that put the patient on the ground, with or without injury<sup>(2)</sup>. Falls are normally due to *intrinsic* causes: resulting from physiological alterations, as a consequence of the natural aging process, pathological alterations, psychological factors and collateral effects of medication; and/or *extrinsic* causes: related to individuals' behavior and activity and their environment. In the hospital context, falls can increase hospitalization time, treatment costs, cause discomfort to the patient and arouse skepticism about nursing care quality and about the responsibility of the care professional<sup>(3)</sup>.

Thus, falls and any event implying harm or even those events representing potential patient harm should be communicated to management through an adequate instrument.

The Nursing Service should seek means to facilitate communicating these events and collecting the necessary information, with a view to promoting patient safety in the hospital environment and establishing means to prevent adverse events and minimize errors.

This research looks at data included in Adverse Events Notification Reports, which were put in practice as communication instruments among Nursing Division professionals at a tertiary university hospital. As from 2004, several care and administrative events were notified in different hospital areas and nurses' conducts were registered.

Data in the Adverse Events Notification Reports were stored in a database and became an important source of alertness and information for patient safety promotion and nursing care management.

## OBJECTIVE

This research aimed to describe the events related to patient falls as notified by the Adverse Events Notification Reports (AENR).

## METHOD

This is a descriptive research. Data were collected from 826 Adverse Events Notification Reports, filled out by health professionals from a tertiary university hospital and forwarded to the nursing directory between January 2004 and June 2006<sup>(4)</sup>. These secondary data were used after authorization by the hospital supervision and approval by the local Research Ethics Committee.

**Statistical analysis** - Data were processed in SPSS 12.0 for Windows and displayed in absolute and relative frequencies. Fall-related events were presented according to the following indicator:

Incidence of falls per patient = No of falls/No patient-day x 1000<sup>(5)</sup>.

## RESULTS

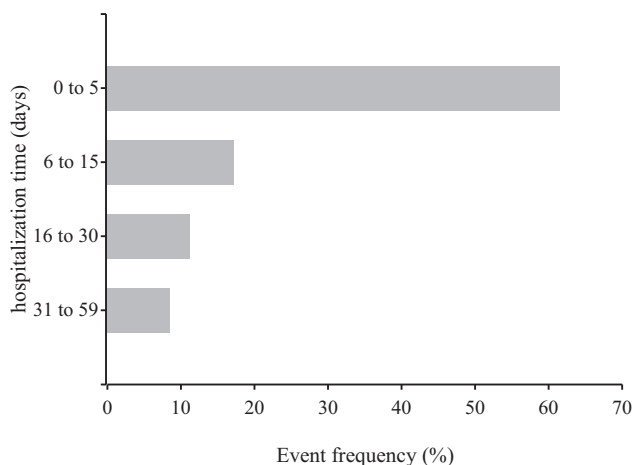
Events related to falls were registered in 80 reports (10.7%) during the 30-month study period, which implies an average of 2.6 falls per month. This results in a fall ratio per patient-day of 0.302 per 1000 during the study period, considering 265,092 patients. Another way to express this relation is the number of falls per 1000 hospitalized patients. In this research, 1.98 fall occurred for every 1,000 hospitalized patients. Notifications were presented across the study period, with higher frequencies in the second semester of 2004 and the first semester of 2005. Falls were classified in three types: fall from bed, from chair and from own height.

Falls from bed were the most frequent (55%), followed by falls from own height (38.8%). Falls from chairs were less frequent (6.2%). Falls from bed were more frequent at the neurology (22.7%), medical clinic (20.4%) and infectious and parasitic disease nursing wards (18.2%). Falls from own height were more frequent at the medical clinic (38.7%) and gastroenterological surgery ward (12.9%).

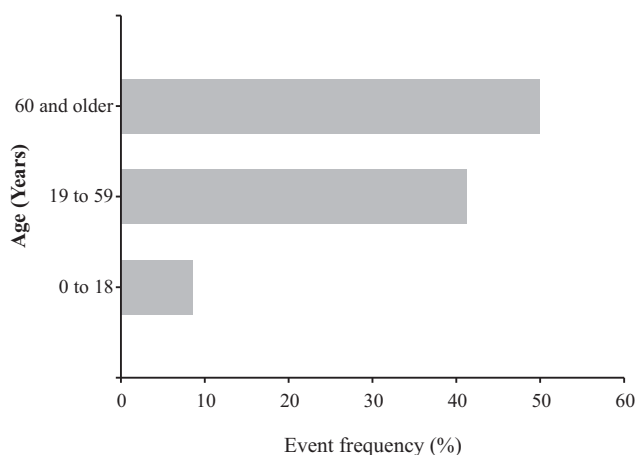
Higher frequencies of falls were found at night (63.7%) and during the first five hospitalization days (61.7%) (Figure 1). Frequencies were higher among male patients (57.5%). Nevertheless, men and women displayed similar frequencies for falls from own height (51.6% and 48.4%, respectively).

Higher prevalence rates of falls were observed in the age range of 60 years or older. In that range, 40 events occurred during the study period, corresponding to 50% of all falls. The average age of patients victims of falls from bed was  $58.5 \pm 21.4$  years, against  $46.4 \pm 24.0$  years for victims of falls from own height and  $58.2 \pm 21.1$  years for falls from chair (Figure 2).

Falls and any event implying harm or even those events representing potential patient harm should be communicated to management through an adequate instrument.



**Figure 1** - Distribution of AENR on patient falls according to number of hospitalization days until the fall - HC/FMB - 2006



**Figure 2** - Distribution of AENR on falls according to age range - HC/FMB - 2006

In 59.2% of cases of falls from bed, the frequency distribution according to disease categories was as follows: infectious and parasitic diseases (18.2%), diseases of the nervous system (18.2%), diseases of the circulatory system (13.7%) and diseases of the digestive system (9.1%). In 61.3% of falls from own height, diagnoses were related to: tumors (19.4%), diseases of the genitourinary system (16.1%), diseases of the circulatory system (12.9%) and diseases of the respiratory system (12.9%).

## DISCUSSION

Health professionals have been concerned with patient falls in the hospital environment. *Incident Reports*, which are similar to the instrument used at the research institution, have been the main form of communicating this event.

In a case-control study published in 2000, based on patient file notes, during a six-month period, 193 falls were found during hospitalization, i.e. around 13 falls per 1,000 hospitalized patients<sup>(6)</sup>. Both studies were carried out at in-

stitutions with similar characteristics. The difference in fall frequency between the two institutions may be related to the little attention paid to this event when the study related to the above paper was carried out. Nowadays, this rate may be lower, considering knowledge about predictive factors of falls and the development of prevention protocols. In the present research, events were more frequent in the second semester of 2004 and the first semester of 2005, with decreasing frequencies in subsequent semesters, possibly due to the emphasis put on guiding the nursing team about risk factors and the establishment of a falls prevention protocol and, later, to the falls risk assessment calculated upon the patient's admission for hospitalization. A research aimed at developing a warning system for falls prevention in hospitalized patient also found that the possibility of falls is higher among patients who are dependent and/or need help for daily living activities. Hence, knowing what patients face greater risks of falls, specific prevention and safety measures can be put in practice, so as to preserve patients' health and care quality<sup>(6)</sup>. A study in the United States found that only 4.8% of patients assessed without risk of falls upon admission actually fell during hospitalization<sup>(7)</sup>.

Among the 80 falls notified by the AENR in this research, 55% were falls from bed, 38.8% from own height and 6.2% from chair. A related publication about 181 patients with a history of falls refers to falls from bed (49%), while walking (43%) and falls from chair (8%)<sup>(8)</sup>. In another study, carried out during one year at 42 intensive nursing care units, 64 falls were reported, in which 80% of patients were walking alone or with help, while 20% were bedridden<sup>(7)</sup>. It is also mentioned that 30% of falls occur when patients get out of bed and go to the bathroom<sup>(9)</sup>. Hence, data from literature are similar to the present research results.

It has been reported that the most common sites for falls in hospitals are the patients' room and bathroom. Falls occur at the bedside, when patients are lying down or getting out of bed or try to climb the grates or foot end. They also happen when patients are in a hurry to go to the toilet and get into or out of the bathroom without help or when they slip on the wet floor. Falls from wheelchairs or fixed chairs may be related to the equipment that has been inappropriately planned or to inadequate transfer techniques when the patient is sitting down or getting up<sup>(10)</sup>.

As to frequency, considering the total number of falls at different hospital units, the following was observed: medical clinic (26.2%), neurology (15%) and infectious and parasitic diseases nursing wards (12.5%). A study that examined the risk of falls related to ergonomic adaptations in buildings' physical environment observed inadequate floor coverage, which was considered slippery, in corridors, rooms and bathrooms, as well as irregularities related to the height and number of support bars installed, the height of plugs and switches and the lack of benches in showers. All of these environmental factors impair patients' equilibrium and create challenges, mainly for elderly patients, and can make them lose stability<sup>(11)</sup>. The research hospital, built

in the 1950's, presents severe problems in terms of physical structure and building conservation. Constants reforms to adapt spaces have attempted to promote patient and team safety and comfort. Several areas do not comply with recommendations, however. In a study of internal areas in four hospitals, it was observed that safety legislation was not respected, mentioning the following examples: stairs without handrails, floors on ramps not slip proof, internal circulation areas with obstacles, flexible doors without viewers<sup>(11)</sup>. In the present research, the fact that units with higher fall frequencies did not have beds with grates and wheel locks may have contributed to falls too. Authors of a North American study mention that, in 31% of 64 patient falls from bed, the grates were down<sup>(7)</sup>.

No fall was informed at the ICU during the study period. With regard to the relation between adverse event rates and the hospital unit's care level, it was observed that units with more severe patients displayed less fall events; at those units, due to their health condition, patients did not walk, which probably decreased the risk of falls<sup>(7)</sup>. The larger number of nurses at intensive care units may have contributed to lower fall rates as well<sup>(7)</sup>. In a study published in 1994, 27.3% of falls were attributed to environmental factors, including nursing staff<sup>(12)</sup>. In this respect, higher fall frequencies were reported at hospital units with a higher number of secondary-education nursing<sup>(7)</sup> than at units where more professionals were nurses<sup>(13)</sup>.

It was also found in this research that most falls occurred at night (63.7%). In daily practice, patients tend not to call nursing to help them do daily activities they consider themselves capable of, such as going to the bathroom, which may worsen at night, when less professionals are present at the unit. This may contribute to higher fall frequencies in that period. In a study published in 2002, higher fall frequencies were found in the night shift too<sup>(7)</sup>. Also, the presence of relatives during hospitalization may help to prevent falls. Hence, this presence should be requested for patients over 65 years of age or with special needs<sup>(14)</sup>.

The maximum incidence level of falls in hospitals varies along with hospitalization time, with most falls occurring in the first week<sup>(14)</sup>. In 61.7% of cases under analysis here, falls happened during the first five days. This may be related to factors like: start of new medication, lack of familiarity with the spatial organization of the environment and anxiety about the new condition.

With regard to the patients' profile, falls predominated among male patients (57.5%), in line with a recent systematic review<sup>(15)</sup> and differently from other studies that ap-

pointed higher prevalence rates among female patients<sup>(6,14)</sup>. The predominance of female nurses may be considered a factor that interferes in patients' decision to ask help, exposing themselves to risk more frequently.

As for age range, higher frequencies were observed among patient aged 60 years or older. For the elderly, these events may represent decreased autonomy and independence by causing disability and injuries<sup>(14)</sup>. Falls also represent the main etiology of accidental deaths in people over 65 years of age who receive care at emergency services in the USA<sup>(16)</sup>. In Brazil, according to data by Datasus/Ministry of Health, the mortality rate due to falls among people over 60 was 6.2 per 1,000 deaths in 2005<sup>(17)</sup>. Brazilian data and a study in North American communities show that 30% of people over 65 fall at least once per year<sup>(18)</sup>. In Brazil, 13% of elderly fall recurrently<sup>(11)</sup>. A Brazilian study mentions that age can be considered a predictive factor to identify patients subject to falls during hospitalization<sup>(6)</sup>.

The most frequent medical diagnoses in this research were related to nervous system, infectious and parasitic diseases, tumors and diseases of the circulatory system. Alterations related to cardiovascular (arrhythmias, heart failure), neurological (epilepsy, Parkinson's disease, cerebrovascular accident), bone-muscle (osteoarthritis, osteoporosis, etc), genitourinary (urinary urgency), psychiatric (dementia, psychomotor agitations) and sensory diseases (decreased visual and hearing acuity) are most frequently mentioned in literature as causes<sup>(2)</sup>. Falls may be the first sign of infectious diseases, which are clinically atypical in the elderly. Medication used to treat the above mentioned situations may also be associated with falls. Diuretic and antihypertensive agents, used in cardiovascular diseases, may decrease cerebral perfusion, so that patients get dizzy, lose consciousness and fall. Psychotropic and anti-Parkinson agents may cause sleepiness, dizziness, weakness and provoke walking disorders. Elderly patients tend to use four or more drugs, which is also related to fall events<sup>(14)</sup>.

## CONCLUSIONS

This research describes the characteristics of falls-related events in hospitals as adverse events. Frequency, type of fall, unit and work shift, patients' hospitalization time and characteristics, including gender, age range and medical diagnosis, are presented and discussed. The importance of detecting risk patients is highlighted, as well as the use of falls prevention protocols and physical adaptations in the hospital environment and furniture with a view to guaranteeing patient safety during hospitalization.

## REFERENCES

1. Unbeck M, Muren O, Lillkrona, U. Identification of adverse events at an orthopedics department in Sweden. *Acta Orthop.* 2008;79(3):396-403.
2. Lawrence JI, Maher PL. An interdisciplinary falls consult team: a collaborative approach to patient falls. *J Nurs Care Qual.* 1992;6(3):21-9.

3. Marin HF. Informática em enfermagem. São Paulo: EPU; 1995. p. 25-8.
4. Paiva MCMS. Eventos adversos: análise de um instrumento de notificação utilizado no gerenciamento de enfermagem [dissertação]. Botucatu: Faculdade de Medicina de Botucatu, Universidade Estadual Paulista; 2008.
5. Mota NVVP, Melleiro MM, Tronchin DMR. A construção de indicadores de qualidade de enfermagem: relato da experiência do Programa de Qualidade Hospitalar. *Rev Adm Saúde*. 2007;9(34):9-15.
6. Marin HF, Bourie P, Safran C. Desenvolvimento de um sistema de alerta para prevenção de quedas em pacientes hospitalizados. *Rev Lat Am Enferm*. 2000;8(1):27-32.
7. Langemo DK, Anderson J, Volden CM. Nursing quality outcome indicators. The North Dakota Study. *J Nurs Adm*. 2002;32(2):98-105.
8. Halpert A, Connors JP. Prevention of patient falls through perceived control and other techniques. *Law Med Health Care*. 1986;14(1):20-4.
9. Rogers S. Reducing falls in a rehabilitation setting: a safer environment through team effort. *Rehabil Nurs*. 1994;19(5):274-6.
10. Sá FD, Moreira IF, Gomes AAM, Assis CB, Almeida FAN, Beltrão GQL, et al. Adaptações ergonômicas e equilíbrio em idosos: análise descritiva do risco de quedas em uma Instituição de Longa Permanência em João Pessoa – PB. In: 26º ENGEPE; 2006 out. 9-11; Fortaleza, BR [evento na Internet]. Fortaleza; 2006. [citado 2008 mar. 20]. Disponível em: [http://www.abepro.org.br/biblioteca/ENGEPE2006\\_TR500335\\_8763.pdf](http://www.abepro.org.br/biblioteca/ENGEPE2006_TR500335_8763.pdf)
11. Pagliuca LMF, Aragão AEA, Almeida PC. Acessibilidade e deficiência física: identificação de barreiras arquitetônicas em áreas internas de hospitais de Sobral, Ceará. *Rev Esc Enferm USP*. 2007;41(4):581-8.
12. Rubenstein LZ, Josephson KR, Robbins AS. The fall in the nursing home. *Ann Int Med*. 1994;121(6):442-51.
13. Blegen MA, Vaughn T. A multisite study of nurse staffing and patient occurrences. *Nurs Econ*. 1998;16(4):196-203.
14. Fabrício SCC, Rodrigues RAP, Costa Junior ML. Causas e consequências de quedas de idosos atendidos em hospital público. *Rev Saúde Pública*. 2004;38(1):93-9.
15. Krauss MJ, Nguyen SL, Dunagan WC, Birge S, Constantinou E, Johnson S, et al. Circumstances of patient falls and injuries in 9 hospitals in a midwestern healthcare system. *Infect Control Hosp Epidemiol*. 2007;28(5):544-50.
16. Fuller GF. Falls in elderly. *Am Fam Physician*. 2000;61(7):2159-68.
17. Brasil. Ministério da Saúde. DATASUS. Informações de saúde. Mortalidade geral. Mortalidade por quedas [texto na Internet]. Brasília; 2005 [citado 2008 jan. 25]. Disponível em: <http://w3.datasus.gov.br/datasus/datasus.php>
18. Tinetti ME, Speechley M. Prevention of falls among the elderly. *N Engl J Med*. 1998;320 (16):1055-9.