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ORIGINALS

Characteristics and circumstances of falls in a hospital environment: a retrospective analysis

Características e circunstâncias das quedas em ambiente hospitalar: análise retrospectiva

Características y circunstancias de las caídas en el ámbito hospitalario: análisis retrospectivo

Maria de Jesus Araújo de Oliveira[1]
Maria Aline Moreira Ximenes[2*]
Maria Lílian Maia Fernandes[3]
Lívia Moreira Barros[4]
Joselany Áfio Caetano[5]

[1]Universidade Federal do Ceará (UFC), Fortaleza, CE.
[2]Universidade Federal do Ceará (UFC), Fortaleza, CE.
[3]Hospital Infantil Filântrópico (SOPAI), Fortaleza, CE.
[4]Universidade da Integração Internacional da Lusofonia Afro-Brasileira, Redenção, CE.
[5]Universidade Federal do Ceará (UFC), Fortaleza, CE

* Correspondence author. Email: alineximenes00@gmail.com. . Orcid: 0000-0002-1674-3357

elocation-id: e646521

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ABSTRACT

Objective: To describe the characteristics and circumstances of falls among hospitalized patients, as well as the post-event interventions implemented by the healthcare team.
Method: A longitudinal and retrospective study analyzing 212 fall notifications involving adult patients in clinical and surgical units of a Brazilian public hospital from January 2015 to December 2021. Data collection was performed using a structured instrument based on information from the service's notification forms, followed by descriptive statistical analysis.
Result: Most patients who experienced falls were elderly (19.81%), male (54.25%), and accompanied by a caregiver at the time of the event (50.00%). Falls predominantly occurred from the patient's own height (66.04%) and within the patient's ward (50.50%). In most notifications, no patient harm was reported (62.27%). Among falls resulting in harm (37.73%), mild injury was the most common (29.25%). Most interventions involved patient and caregiver orientation measures.
Conclusion: Information regarding the occurrence of falls and their primary characteristics can support professionals and managers in risk assessment and the implementation of prevention strategies within hospital services.

Keywords: Patient safety; Inpatients; Accidental falls; Nursing.

RESUMEN:

Objetivo: Describir las características y circunstancias de las caídas entre pacientes hospitalizados, así como las acciones tomadas por el equipo de salud tras la ocurrencia del evento.
Método: Estudio longitudinal y retrospectivo que analizó 212 notificaciones de caídas de pacientes

adultos en unidades clínicas y quirúrgicas de un hospital público brasileño, desde enero de 2015 hasta diciembre de 2021. Para la recolección de datos, se utilizó un instrumento estructurado basado en la información de las fichas de notificación del servicio, realizándose un análisis estadístico descriptivo.
Resultados: La mayoría de los pacientes que sufrieron caídas eran personas mayores (19,81%), del sexo masculino (54,25%) y con la presencia de un acompañante (50,00%). Las caídas ocurrieron desde su propia altura (66,04%) y en la habitación (50,50%). En la mayoría de las notificaciones no se reportaron daños al paciente (62,27%). Entre las caídas con daño (37,73%), el daño leve fue el más común (29,25%). La mayoría de las intervenciones realizadas involucraron medidas de orientación al paciente y al acompañante.
Conclusión: La información sobre la ocurrencia de caídas y sus principales características puede apoyar a los profesionales y gestores en la evaluación de riesgos y en la implementación de estrategias de prevención en los servicios hospitalarios.

Palabras clave: Seguridad del Paciente; Pacientes Internos; Accidentes por Caídas; Enfermería.

INTRODUCTION

Falls are defined as unintentional displacements of the body to a level lower than the initial position, provoked by multifactorial circumstances, and may or may not result in injury[1]. These are undesirable events in the hospital context due to the associated economic and social costs, as well as the increased risk of patient dependency and institutionalization. In 2023, the Notivisa system recorded more than 30,000 reports of patient falls in Brazilian healthcare services[2].

Falls in hospital environments constitute adverse events of high relevance, as they are associated with fractures, lacerations, and hemorrhages, while also contributing to prolonged hospital stays and increased utilization of health services. Given the progression of acute and chronic diseases, many patients lose awareness of their functional deficits and are unfamiliar with the hospital environment, which can lead to impaired judgment and, consequently, falls[3].

In the United States, approximately one million inpatient falls occur each year; more than 250,000 result in injuries and approximately 11,000 are associated with deaths[4].

Given the negative effects related to falls, it is necessary to implement interventions for the prevention of such events during hospitalization, alongside rigorous monitoring and investigation. Understanding the characteristics involved in the occurrence of falls can substantiate preventive planning[5].

It is noteworthy that the literature on falls is predominantly directed toward the elderly population in domestic, outpatient, or long-term care settings[5]. Although previous research has identified risk factors for falls in hospitals[6,7], limitations remain regarding the analysis of triggering circumstances, types of falls, resulting harms, and subsequent actions taken—knowledge of which is essential for the development of intervention programs.

Thus, the relevance of this study is emphasized, as its findings may assist in understanding these events within the hospital, including observations related to the patient, the care environment, and professional assessment, thereby aiding in the planning of preventive interventions. Furthermore, by focusing on patient falls, this manuscript contributes to the strengthening of national public policies through the Falls Prevention protocol and aligns with the Global Patient Safety Action Plan 2021–2030, in which the prevention of falls and related injuries is a priority objective[8].

In light of these factors, the present study aimed to describe the characteristics and circumstances of falls among hospitalized patients, as well as the interventions performed by the healthcare team following the occurrence of the event.

MATERIAL AND METHOD

This retrospective longitudinal study was conducted at a high-complexity university hospital located in Ceará, Brazil, with 250 beds, which is part of the sentinel network of the *Agência Nacional de Vigilância Sanitária* (ANVISA).

The study sample comprised 212 notifications of patients who experienced falls, recorded by the hospital's Patient Safety Units and archived in the online reporting system VIGIHOSP between January 2015 and December 2021. Data were obtained from VIGIHOSP, an electronic reporting and risk-management system developed by the Brazilian Company of Hospital Services (EBSERH) and institutionally used by the study hospital to record incidents, technical complaints, diseases, and other care-related events. This study accessed only fall reports recorded at the hospital between January 2015 and December 2021. Reporting is voluntary, may be anonymous, and can be performed by different professional categories; reports are reviewed by the institutional risk-management sector[9]. VIGIHOSP was not used as a diagnostic instrument or as a validated measure of incidence, but as an institutional secondary data source.

Voluntary incident-reporting systems are useful for identifying patterns and learning opportunities, but they do not necessarily capture all events and cannot independently estimate true incidence. Therefore, the findings should be interpreted as the profile of reported falls and are subject to underreporting, reporting bias, incomplete records, and variation in professionals' willingness to report[10].

The inclusion criteria were: patients admitted to inpatient units who experienced a fall during hospitalization and had the event reported to the fall notification service (VIGIHOSP). Illegible, incomplete, or duplicate records were excluded. It is noteworthy that reporting of these events is voluntary and performed by various categories of healthcare professionals, with the purpose of notifying the event to the Risk Management Department.

Data were collected retrospectively from June to October 2022, based on information recorded in a structured instrument developed from the institutional notification form and the hospital's online incident reporting system, routinely used by the Hospital Quality Service. The data collection process involved the identification, extraction, and organization of records related to reported falls. A census sampling strategy was adopted, including all eligible notifications from medical and surgical units of the institution during the analyzed period. Data were systematized in electronic spreadsheets (Microsoft Excel®), encompassing variables related to the event, such as date and work shift of occurrence, patient sex and age, hospital location and unit, presence or absence of harm, conduct adopted after the incident, and professional category of the notifier. It should be emphasized that, as this is a spontaneous reporting system, underreporting bias and inconsistencies in records may be present.

The classification adopted for types of harm was as follows: None: no consequence to the patient; Mild: the patient presented mild symptoms, minimal or intermediate short-term harm without intervention or requiring minimal intervention (minor treatment or

observation); Moderate: the patient required intervention (e.g., additional procedure or therapy), prolonged hospitalization, experienced loss of function, or sustained permanent or long-term harm; Severe: intervention was required to sustain life, major medical-surgical intervention was necessary, or the event resulted in major permanent or long-term harm; fetal distress/risk or congenital anomaly; and Death (caused by the adverse event)[11].

Descriptive statistical analysis was performed using the R Project for Statistical software. The study was approved by the institution's Research Ethics Committee under Opinion No. 5,436,435.

RESULTS

Between January 2015 and December 2021, 212 falls were reported, representing an annual average of 30.28 notifications. Nursing professionals constituted the primary category responsible for reporting, accounting for 95.3% of the notifications.

Patients who experienced falls were predominantly male (54.25%) and of mixed-race ethnicity (70.75%). Regarding age distribution, the most affected group was the 60–69 age bracket (19.81%), followed by patients aged 70 and over (12.26%). Notably, patient age was missing in 24.05% of the notifications.

The highest incidence of falls occurred during the morning shift (39.15%), followed by the night shift (33.0%). Concerning the circumstances of the events, the most frequent type was falling from one's own height (66.04%), while falls from bed represented 17.47%. The locations with the highest occurrence were wards (50.50%) and bathrooms (33.50%). In 50% of the notified cases, patients were in the presence of a caregiver at the time of the fall.

Among cases involving harm (37.73%), mild harm was the most frequent (29.25%), followed by moderate harm (6.60%), severe harm (0.94%), and death (0.94%). Two fractures and two deaths were recorded.

Table 1 presents the distribution of falls, correlating the resulting harm to the patient with the year of notification.

Table 1: Harm resulting from falls among patients, from January to December, 2015 to 2021. Fortaleza, 2022.

Type of Harm	2015	2016	2017	2018	2019	2020	2021	Total
Pain	-	-	2 (2.5%)	2 (2.5%)	1 (1.25%)	6 (7.5%)	15 (18.75%)	26 (32.50%)
Blunt-force wound (no suture)	-	1 (1.25%)	1 (1.25%)	1 (1.25%)	-	1 (1.25%)	1 (1.25%)	5 (6.25%)
Hematoma	1 (1.25%)	4 (5.0%)	2 (2.5%)	4 (5.0%)	5 (6.25%)	1 (1.25%)	5 (6.25%)	22 (27.5%)
Abrasions	-	1 (1.25%)	2 (2.5%)	4 (5.0%)	2 (2.5%)	1 (1.25%)	4 (5.0%)	14 (17.5%)
Blunt-force wound (with suture)	-	1 (1.25%)	3 (3.75%)	-	-	-	2 (2.5%)	6 (7.5%)
Mild/moderate bleeding	-	-	1 (1.25%)	-	-	1 (1.25%)	1 (1.25%)	3 (3.75%)
Fracture	-	-	1 (1.25%)	-	-	-	1 (1.25%)	2 (2.5%)
Death	2 (2.5%)	-	-	-	-	-	-	2 (2.5%)
Total	**3 (3.75%)**	**7 (8.75%)**	**12 (15%)**	**11 (13.75%)**	**8 (10%)**	**10 (12.5%)**	**29 (36.25%)**	**80 (100%)**

Source: Research data (2022)

As most falls resulted in no harm or mild injury, most professional interventions focused on patient and caregiver orientation measures, as detailed in Table 2.

Table 2: Post-fall management implemented by the healthcare team, 2015 to 2021. Fortaleza, 2022.

Type of Intervention	Frequency	Percentage (%)
Patient/caregiver orientation	66	31.10
Medical evaluation	56	26.40
Nurse/nursing team evaluation	37	17.50
Imaging exams	24	11.30
Physician/nurse communication	19	9.0
Patient observation	7	3.30
Not reported	3	1.40
Total	**212**	**100**

Source: Research data (2022)

DISCUSSION

Falls in inpatient units reported during the study period predominantly affected older men. It is noteworthy that the difference between sexes was small and that sex itself is not considered an independent risk factor for falls. However, previous studies have shown that men experience more falls during hospitalization compared with women, with a prevalence ranging from 52% to 75%[12,13,14], which is consistent with the findings of the present study.

Most patients who fell and sustained harm were older adults, similar to findings from other national and international investigations reporting a mean age between 60 and 77 years among individuals who experienced falls during hospitalization[15,16,17,18].

Older adults are more vulnerable to fall-related injuries due to coexisting health conditions, such as chronic degenerative diseases[13]. Moreover, the aging process itself—characterized by reduced functional and cognitive capacity and changes in physical mobility—may further increase the risk of falls[18]. In light of this, prioritizing the geriatric population in hospital-based fall prevention strategies is essential.

The highest frequency of reported falls occurred during the morning and night shifts. The increased occurrence in the morning may be explained by the higher workload and activity demands placed on healthcare professionals during this period, potentially leading to reduced patient supervision or increased environmental risk, such as during ward cleaning. Additionally, the morning represents a more active period for patients, when activities such as bathing and ambulation are commonly performed[15].

A substantial number of falls also occurred during the night shift, corroborating findings from other studies[15,19]. Evidence indicates that hospitalized patients often fail to recognize the risks to which they are exposed and, consequently, may refrain from requesting assistance, believing they are capable of independently performing activities such as getting out of bed or going to the bathroom[19,20]. These behaviors, combined with age-related physiological sensory changes—particularly considering that most falls involved patients older than 60 years—further increase the risk of falls, especially during nighttime hours.

Falls occurred predominantly from standing height and within the patient's room. This type of incident is generally associated with movements to and from the bathroom, a space where patients spend most of their time during hospitalization[18]. Falls from standing height were also the most frequently reported type in other studies[15,16,19].

In 50% of the reported fall cases, companions were present at the time of the event. This finding differs from other studies in which patients were alone at the time of the fall[15,18]. The presence of companions during the event aligns with findings from a U.S.-based study indicating that unassisted falls are more likely to result in severe injuries compared with falls assisted by companions[21].

Effective communication between healthcare professionals and companions constitutes a key element in fall prevention. Therefore, it should be a priority for healthcare professionals to provide guidance to companions regarding their supervisory role and the importance of seeking assistance in situations of risk[22].

In most reported falls, no harm to the patient was documented. Events resulting in harm accounted for 37.73% of the total in the present study. Other investigations conducted in hospital settings have reported fall-related injury rates ranging from 23% to 39%[23,24,15].

A total of 80 falls with harm were reported during the study period, most commonly involving pain, bruises, and abrasions. Among the severe fall-related injuries, fractures and two deaths were recorded. It should be noted that the specific types or anatomical locations of fractures were not detailed in the notifications. Other studies corroborate

these findings, reporting lacerations, fractures, bruises, and head trauma among the most frequently documented injuries[25,26].

Hospitalized patients are often clinically vulnerable and may present conditions that increase the likelihood of worsening injuries resulting from falls, particularly older patients, those with multiple comorbidities, or individuals with hematological alterations[18].

Therefore, comprehensive risk assessment following a fall is essential. In the present study, patient and companion education were identified as the primary interventions, given that most events did not result in harm. Medical and nursing evaluations were also recorded; however, the notifications did not specify the nature or scope of the measures implemented.

International hospital guidelines recommend an immediate clinical response after a fall, including assessment for possible injuries, investigation of the circumstances and causes of the event, increased monitoring according to the patient's clinical condition, comprehensive reassessment of risk factors, including medication review, updating the care plan, and communication with the multidisciplinary team[27]. These measures support the early identification of fall-related consequences and the implementation of interventions to prevent recurrent events[28].

Although the risk of falls is inherent to hospitalization and cannot be eliminated due to intrinsic, extrinsic, and behavioral patient-related factors, it is imperative to foster a culture of safety within healthcare institutions. Healthcare professionals must be sensitized to the importance of preventive measures and the potential adverse consequences of falls on patient recovery.

This study has limitations related to its single-center design and the retrospective use of data from a voluntary reporting system. Therefore, the number of records analyzed does not necessarily represent the total incidence of falls during the study period. More severe events may have been reported more frequently, whereas falls resulting in no harm or mild harm may be underrepresented. Incomplete fields, differences in safety culture, and a punitive perception of reporting may also have influenced the quantity and quality of the records[1º]. Consequently, the findings should be interpreted as a characterization of reported falls rather than of all falls that occurred at the institution.

Considering these limitations, further studies—preferably multicenter in design—are recommended, along with the strengthening of educational and awareness strategies targeting the multidisciplinary team, to improve the quality of reporting and support preventive actions aimed at enhancing the safety of hospitalized patients.

CONCLUSION

The findings of this study delineate the primary characteristics of the 212 fall notifications recorded at a public hospital in Ceará. The most prevalent events involved falls from the patient's own height, occurring within the hospital ward during the morning shift, with elderly male patients being the most frequently affected group. Most falls did not result in patient harm; among those that did, mild and moderate injuries were the most prominent. Consistent with the high incidence of no-harm or low-harm events, most

professional interventions focused on orientation measures for both patients and their caregivers.

It is emphasized that detailed information regarding the occurrence and specific characteristics of falls serves as a critical resource for healthcare professionals and administrators. Such data can substantiate risk assessment processes and guide the implementation of targeted prevention strategies within hospital services to enhance patient safety.

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