Factors associated with patient safety incidents among elderly people in intensive care

Fatores associados aos incidentes de segurança entre idosos em terapia intensiva

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Keywords
Patient safety; Aged; Intensive care units; Safety management; Geriatric nursing

Descritores
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Abstract

Objective: Verify demographic and clinical factors associated with patient safety incidents among elderly people in intensive care.

Methods: Retrospective study of 112 medical records of elderly people admitted to an intensive care unit in 2015. The data were collected from January to June 2016, using: a form for population characterization; the Simplified Acute Physiology Score II; the Charlson Comorbidity Index and the International Classification for Patient Safety; analyzed by multiple linear regression ($p < 0.05$).

Results: Length of stay increased all types of no harm incidents, general adverse events, clinical process/procedure and infection. There was a higher number of nutrition-related no harm incidents among men, and administration-related adverse events among women. The age group of 69 to 70 years increased the number of medication-related no harm incidents. Hospitalization for clinical reasons increased behavior-related no harm incidents, whereas for surgical reasons it boosted the number of infection-related adverse events.

Conclusion: Length of stay; sex; age group and hospitalization were associated with increased no harm incidents and adverse events.

Resumo

Objetivo: Verificar os fatores demográficos e clínicos associados aos incidentes de segurança entre idosos em terapia intensiva.

Métodos: Estudo retrospectivo em prontuários de 112 admissões de idosos internados na Unidade de Terapia Intensiva em 2015. Os dados foram coletados de janeiro a junho de 2016, utilizando: Formulário de caracterização da população, *Simplified Acute Physiology Score* II; índice de *Charlson* e a Classificação Internacional de Segurança do Paciente; analisados por regressão linear múltipla ($p<0,05$).

Resultados: O tempo de internação aumentou todos os tipos de incidentes sem dano (ISD), eventos adversos (EA) geral, processo/procedimento e infecção. O sexo masculino aumentou os ISD de dieta e, o feminino, EA de administração. O grupo etário de 60 a 79 anos aumentou ISD de medicação. A internação clínica aumentou os ISD de comportamento e, a cirúrgica, EA de infecção.

Conclusão: Tempo de internação; sexo, grupo etário e internação associaram-se ao aumento de ISD e EA.

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Introduction

Population aging creates greater demand for health services among the elderly, just as the demographic transition process has increased non-communicable chronic diseases.[1] This has contributed to raising the number of hospitalizations of elderly people who sometimes times need to be admitted to intensive care units (ICUs),[1] environments that require more technology to care for severe, complex patients, with exposure to invasive procedures.[2]

As a result, concern about the safety of ICU patients is growing and has generated an increased number of studies on the topic.[2-18] In Brazil, patient safety was strengthened through the report entitled "To err is human: building a safer health system" and the efforts of the World Health Organization (WHO), Pan American Health Organization (PAHO), and the Brazilian National Accreditation Agency (ONA) and National Health Surveillance Agency (ANVISA), that created programs, classifications and laws aimed at reducing the frequency of patient safety incidents and improving healthcare safety.[5]

Patient safety incidents are events that could have resulted, or did result, in unnecessary harm to a patient. They are divided into the following categories: reportable circumstance, defined as having a significant potential to cause harm, but which did not occur; near miss, when the incident did not reach the patient; no harm incident, when it reaches the patient, but no discernible harm resulted; and adverse event, when it results in unintentional harm arising from care and not related to the natural evolution of the disease.[19]

There are 13 types of patient safety incidents: clinical administration, clinical process/procedure, documentation, healthcare-associated infection, medication/IV fluids, blood/blood products, nutrition, oxygen/gas/vapor, medical device/equipment, behavior, patient accidents, infrastructure/building/fixtures and resources/organizational management.[19] Despite this classification, its use is still in the beginning stages in the literature.[18] Scientific production on this theme is characterized by specific focuses and has analyzed each incident type in isolation in populations that include both adults and elderly people.[4,6-15] Overall, they investigate medication incidents,[3,10] loss of medical devices,[11] infection,[18] pressure sores,[4] and behavioral problems,[12] among others, making comparisons with other realities difficult.

Internationally, studies have explored the avoidability of adverse events.[7,9] The national level is characterized by the epidemiology of adverse events and their relationship with patient severity, comorbidities, nursing workload, length of stay and reason for hospitalization.[6,9-11,13-16] Nursing workload and length of stay are factors associated with the occurrence of adverse events.[6] However, specific data related to elderly people are scarce and the factors associated with patient safety incidents are not clear.[18]

It is known, however, that elderly people account for a large number of occurrences of adverse events.[20,21] In Australia, a study that evaluated drug use patterns, identified polypharmacy among 81% of the elderly patients in an ICU and, of these, 28% suffered from kidney disease. In addition, the presence of comorbidities ($p<0.001$) and age ($p=0.01$) was associated with polypharmacy, and this risk was linked to prescription errors ($p=0.009$).[3]

Considering the specificity of elderly care, the accelerated growth of this population and the prevalence of ICU patient safety incidents in this group, there is a need for scientific production to fill in knowledge gaps, as seen by the lack of studies that investigate the topic of this current study, which is to understand which incident types are specifically occurring among elderly people in these environments, the factors associated with them and identify which ones use the standardized WHO terminology in order compare these studies with other realities. Thus, it is possible that the results of this study will have an impact on clinical practices, resulting in safer and higher quality care.

The objective, therefore, was to determine the demographic and clinical factors associated with patient safety incidents among elderly people in intensive care.

Methods

Retrospective, quantitative study conducted in an adult ICU (ICU-A) in a public hospital in a city in the state of Minas Gerais.

The ICU-A has ten beds and treat potentially severe patients. The population was a non-probabilistic sample of every patient admitted to the ICU-A from January to December 2015 who met the established criteria: being 60 years of age or older and having been admitted to the ICU-A in the period from January to December 2015. ICU-A admissions lasting 24 hours or less were excluded, since it would not have been possible to conclude whether the occurrence of a patient safety incident during this period of time was entirely related to this sector, in that clinical developments could arise among such patients related to therapeutic and/or invasive treatments performed in the sector of origin. In the period studied, of the total 706 ICU patients, 155 (22%) were elderly. Three of them were admitted twice, resulting in a total of 158 (22.3%) admissions of elderly people. Of these, 21 (13.3%) were excluded and 25 (15.8%) medical records were not analyzed since they were not found by the Medical File Service (SAME) and 10 (6.5%) were used in the pilot study to adjust the data collection instruments. Therefore, 112 (70.9%) admissions were examined; corresponding to 109 elderly patients (70.3%). The data collection was carried out between January and June 2016 in the Medical File Service, on business days from 8 to 11 am and from 1 to 5 pm, by the researcher, who was a nurse not belonging to the ICU-A. This also entailed reviewing parts of non-electronic medical records, such as nursing notes, -inter-consultations, prescription and clinical developments in order to gather information about potential patient safety incidents. This nurse then classified these incidents according to the International Classification for Patient Safety (ICPS) in the categories that best described them. Incidents not under the responsibility of the nurse to evaluate were not included. When it was not possible to determine whether certain incidents resulted in patient harm, the nurse categorized them as adverse events, separating them from other patient safety incidents that were designated as no harm incidents, according to the ICPS.[19] Harm was defined by the researcher as the presence of signs, symptoms, increased length of stay and need for intervention resulting from an incident.[19] Therefore, the following were considered adverse events: development of pressure sores, adverse drug reactions, contact dermatitis, phlebitis and injuries, among others. It was decided to use only one researcher so as to control the standardization of data collection.

Nine of the 13 incident types from the ICPS were investigated: clinical administration; clinical process/procedure; documentation; healthcare-associated infection; medication/IV fluids; blood/blood products; nutrition; behavior; and patient accidents.[19] The other incident types were not collected due to lack of information about them in the medical records. Incidents that occurred before or after discharge from the ICU-A were not tabulated. It was decided to use only no harm incidents and adverse events; the others, such as near miss and reportable circumstance, were not collected since it was not possible to identify them retrospectively in the medical records.

Each patient safety incident was classified, as shown in chart 1.

The instruments used consisted of forms developed by the researcher to characterize the population and patient safety incident, as well as the Simplified Acute Physiology Score II (SAPS II) that assesses intra-hospital severity of adults in ICUs based on data from the first 24 hours of hospitalization (validated in Brazil)[20] and the Charlson Comorbidity Index (CCI) that calculates patient morbidity load, regardless of the main diagnosis in a period of up to one year (also validated in Brazil).[22] To check the tailoring of the forms developed by the researcher to the objectives of the study, a pilot study was performed with ten medical records.

The variables studied were sex, age group, reason for ICU-A admission, length of stay in the ICU-A, CCI score, SAPS II score, evolution after ICU-A discharge and types of no harm incidents and adverse events.

An Excel® electronic spreadsheet was created, with dual entry and checking for consistency between the two databases. The data were imported to the Statistical Package for the Social Sciences® (SPSS - 21.0), after which the analyses were conducted.

Table 1. Types and description of patient safety incidents

Type	Description of the patient safety incidents considered
Clinical administration	Ho harm incidents; inter-consultations not answered in 24 hours. Adverse events: discharges suspended due to lack of beds for transfer
Clinical process/procedure	No harm incidents due to procedure/treatment/intervention not carried out when indicated or unavailable: procedures or surgeries not carried out or suspended (except due to the patient's clinical condition); standardized medication not available; various materials not available; not medicated due to lack of medication or materials; not medicated due to not having a nasoenteral tube. No harm incidents due to inadequate or contraindicated procedure/treatment/intervention: vasoactive drugs in peripheral venous catheter; vasoactive drugs in external central catheter; invasive arterial puncture in cyanotic limb; salinized central venous catheter; selective orotracheal tube; indwelling urinary catheter clamped for more than three hours for test collection; disconnection of the parenteral nutrition infusion route during transport; transport to other sectors in an artificial manual breathing unit; sterile procedure not according to protocol due to lack of material; intubation with dental prostheses; surgery scheduled but not performed, due to no fasting; late tracheostomy; sedated in pressure support ventilation mode; no enteral feeding during hemodialysis; enteral feeding administered to patient with lactose intolerance; leakage of lacerating content of the drain onto the skin; obstruction of the tracheal or orotracheal tube due to secretion stoppers. Adverse events related to general care resulting in skin injury due to: pressure; catheters and different devices or their attachment mechanisms; bruises; contact dermatitis; phlebitis; and others. Adverse events due to procedures/treatments/interventions: perforating or penetrating traumas due to procedures; subcutaneous emphysema due to drainage of the chest; postoperative tachydyspnea due to inadequate devices; tachydyspnea due to obstructions of the tracheal or orotracheal tube because of secretion stoppers; cardiac arrest during transport; cardiac arrest after planned extubation; hemorrhage via orotracheal tube after intubation procedure; failure in planned extubation. Other adverse events: bronchoaspiration; hypoglycemia; diarrhea from enteral feeding; oral feeding drainage due to respiratory devices; tachydyspnea due to mechanical ventilator failure or damage; persistent apnea in pressure support ventilation mode.
Documentation	No harm incidents in medical prescriptions: antibiotics and other medications without dilution mode; without time and infusion route; without dose and desired schedule between doses; erasures on the medical prescription; unsigned or unstamped prescriptions; repeated medical observations; duplicates of items; lack of electronic prescription on day of admission. The number of each type was tabulated. No harm incidents in medical progress notes: no medical progress notes during the shift (morning, afternoon and night). No harm incidents in nursing records related to medical prescriptions: checks without signature; medication without checking; lack of explanation for medication not administered; among others. No harm incidents in nursing notes: unstamped reports from nurses, nursing technicians or nursing students; no nursing report from the shift (morning, afternoon or night). Other no harm incidents in nursing notes: no admission record or discharge summary; admission without complete list of invasive devices; changes in flow rate of vasoactive drugs and sedatives not reported; procedures or transport not reported; discharge to ward without transfer time; nasoenteral tube inserted without auscultation test.
Documentation	Other documentation-related no harm incidents: printed forms for release of items from the pharmacy not filled in; lost medical record documents.
Healthcare-associated infection	Adverse events: healthcare-associated infections in the ICU-A after 72 hours of hospitalization, primarily pulmonary, urinary, abdominal, blood, surgical or others. The HICC records were examined for report of infections acquired in the ICU-A.
Medication/IV fluids	No harm incidents: prescription of a drug to which the patient is allergic; medication not dispensed by the pharmacy; antibiotics not administered. Adverse events: adverse drug reactions.
Blood/blood products: cellular products; coagulation factors, albumin, plasma proteins and immunoglobulin	No harm incidents in medical prescriptions: not prescribed, without volume, route, time and schedule to be administered. No harm incidents in nursing monitoring records (checklist): incomplete in sections for sample identification, administration and after administration of the blood product, transfusion reaction, incomplete vital signs, blank nursing progress notes. No harm incidents related to contraindications: blood transfusion with fever.
Nutrition	No harm incidents: late delivery of enteral feeding by the nutrition service; prolonged fasting; no parenteral feeding for an extended length of time; enteral feeding administered to lactose intolerant patient.
Medical devices/equipment	No harm incidents related to loss or removal of devices: invasive arterial catheter, central venous catheter, peripheral venous catheter and indwelling urinary catheter; non-enteral, enteral, nasogastric and orogastric tubes; various drains; orotracheal and tracheostomy cannulae. No harm incidents related to equipment or devices with a failure or damage: in the mechanical ventilator; dialysis equipment; tomography; invasive blood pressure transducer, cracks or leakage in catheters or tubes.
Behavior	No harm incidents: agitation, disorientation/confusion or aggressiveness on the part of the patient. Only those involving the patient were considered.
Patient accidents	Adverse events: fall, shock-related accidents, burns, freezing, drowning, poisoning and corrosive substances, among others.

Source: World Health Organization, 2009.

Descriptive analysis and multiple linear regression were used for each type of incident ($p \leq 0.05$). The following were considered to be patient safety incident predictors: age group, reason for ICU-A admission, SAPS II and CCI. To proceed with the analyses, the variables were dichotomized: sex, age group (60 to 79 years and 80 years or older), reason for hospitalization (clinical or surgical). All the prerequisites for the parametric tests were evaluated, including a residual analysis in the linear regression. When the distribution was not normal, the median was used as a tendency and variability measurement.

The project was approved by the Human Research Ethics Committee of Triângulo Mineiro Federal University; Opinion No. 1537.354.

Results

In the study, 109 elderly people were investigated, totaling 112 admissions, where 52.8% were men, with a predominant age range of 60 to 69 years (44.4%).

Most of the ICU-A admissions had surgical reasons (80.4%). The median for the length of

stay in the ICU-A was four days, varying from one to 103. The CCI median was two, varying from 0 to 11 points. The SAPS II mean was 54.8 (±18.29) points. The predominant outcome was discharge (55.4%). However, the percentage of deaths was 44.6%, of which 33% occurred in the ICU-A.

There were 12,343 patient safety incidents, of which 12,007 (97.3%) were no harm incidents, predominantly related to documentation (10,574; 88.1%), followed by clinical process/procedure (599; 5%), blood/blood products (221; 1.8%), behavior (203; 1.7%), medical devices/equipment (192; 1.6%), medication/IV fluids (101; 0.8%), nutrition (93; 0.7%) and clinical administration (24; 0.2%). Of the total number of patient safety incidents, 336 (2.7%) were adverse events, primarily clinical process/procedure (260; 77.4%), followed by healthcare-associated infection (65; 19.3%), clinical administration (7; 2.1%) and medication/IV fluids (4; 1.2%).

The male sex variable had an influence on the increase in nutrition-related no harm incidents (β=0.187; p=0.041) and the age group from 60 to 69 years was associated with increased no harm incidents of medication/IV fluids (β=0.175; p=0.043) (Table 1).

Length of stay in the ICU increased no harm incidents: general (β=0.924; p≤0.001), clinical administration (β=0.305; p=0.005), clinical procedure/process (β=0.867; p≤0.001), documentation (β=0.907; p≤0.001), medication/IV fluids (β=0.451; p≤0.001), nutrition (β=0.291; p=0.002); medical devices/equipment (β=0.758; p≤0.001) and behavior (β=0.321; p=0.001); indicating that the longer the length of stay in the ICU-A, the greater the overall number and stratification of no harm incidents (Table 1).

Reason for hospitalization had a bearing on the occurrence of behavior-related no harm incidents (β=-0.214; p=0.019). The SAPS II did not influence any types of no harm incident. It was found that the lower the weight of comorbidities, the higher the frequency of no harm incidents related to medication/IV fluids (β=-0.198; p=0.026) and nutrition (β=-0.216; p=0.019) (Table 1).

The female sex variable was a predictor of increased clinical administration adverse events (β=-0.259; p=0.035). Length of stay had a bearing on the occurrence of general adverse events (β=0.911; p≤0.001), clinical process/procedure (β=0.901; p≤0.001) and healthcare-associated infection (β=0.529; p≤0.001). Reason for hospitalization (surgery) was a predictor of healthcare-associated infection adverse events (β=0.225; p=0.006). The SAPS II did not influence the frequency of any of the adverse event types, unlike the CCI (Table 2).

Discussion

The prevalence of hospitalization of men was consistent with national[23] and international[24,25] studies. It is possible that the fact that men seek medical services less makes them prone to ICU admission due to the appearance of complications related to chronic diseases, at times not diagnosed. On the other hand, women, since they procure medical services more often, have more stable clinical conditions.[26]

In relation to age group, the national survey results were similar to those in this study, with a predominance of elderly people under 80 years old.[23] Internationally, one study found that most of the patients were between 75 and 84 years of age (41.3%).[24] The main cause of ICU admission was different than that found in the Brazilian[27] and international[24,25] literature, where the primary reason was clinical. To understand these differences, reason for hospitalization and age group should not be examined in isolation, but in conjunction with other factors, such as disease severity and other diagnoses.[27]

In different Brazilian studies, the mean length of time in the ICU was similar to this study,[4,23] whereas internationally it was less.[24,25] Various factors related to length of time in the ICU should be taken into account, such as length of time of sedation, vasoactive drugs and drains; postoperative complications, sepsis and others.[28] Better use of sedation and analgesia protocols in developed countries may explain the briefer length of stay.[28]

Table 1. Analysis of the influence of demographic and clinical variables on the overall and stratified frequency of no harm incidents in admissions of elderly people to an ICU-A in a public hospital

No harm incidents	Sex[a] β (p)	Age group[b] β (p)	Length of stay β (p)	Reason for hospitalization[c] β (p)	Simplified Acute Physiology Score II β (p)	Charlson Comorbidity Index β (p)
General	0.013(0.35)	0.068(0.061)	0.924(±0.001)	-0.071(0.052)	0.057(0.115)	-0.058(0.116)
Clinical administration	-0.098(0.362)	0.048(0.642)	0.305(0.005)	-0.151(0.151)	0.159(0.128)	-0.016(0.881)
Process/procedure	0.039(0.424)	0.023(0.625)	0.867(≤ 0.001)	-0.072(0.129)	0.028(0.552)	-0.012(0.806)
Documentation	0.010(0.803)	0.075(0.063)	0.907(≤ 0.001)	-0.067(0.100)	0.060(0.134)	-0.066(0.109)
Medication/IV fluids	-0.015(0.869)	0.175(0.043)	0.451(≤ 0.001)	-0.056(0.520)	0.071(0.407)	-0.198(0.026)
Blood/blood products	*	*	*	*	*	*
Nutrition	0.187(0.041)	-0.060(0.495)	0.291 (0.002)	0.015(0.862)	0.160(0.073)	-0.216(0.019)
Devices/equipment	-0.027(0.672)	0.011(0.856)	0.758(≤ 0.001)	-0.118(0.061)	0.061(0.329)	-0.098(0.127)
Behavior	0.115(0.215)	0.088(0.329)	0.321(0.001)	-0.214(0.019)	-0.123(0.174)	-0.015(0.873)

Source: the author, 2016.

(a) - reference variable: female sex; (b) - reference variable: elderly people 80 years of age or older; (c) - reference variable: reason for hospitalization (clinical). * - it was not possible to do a linear regression for the blood/blood products incident type due to the low number of admissions (26) that received that intervention. Statistical test - linear regression

Table 2. Analysis of the influence of demographic and clinical variables on the overall and stratified frequency of adverse events in admissions of elderly people to an ICU-A in a public hospital

Adverse Events	Sex[a] β (p)	Age group[b] β (p)	Length of stay β (p)	Reason for hospitalization[c] β (p)	Simplified Acute Physiology Score II β (p)	Charlson Comorbidity Index β (p)
General	-0.008(0.847)	-0.020(0.607)	0.911(±0.001)	0.020(0.598)	0.067(0.079)	0.054(0.166)
Clinical administration	-0.259(0.035)	0.054(0.648)	0.069(0.577)	-0.082(0.488)	0.148(0.211)	-0.013(0.913)
Process/procedure	0.006(0.890)	-0.027(0.497)	0.901(±0.001)	-0.010(0.806)	0.060(0.128)	0.054(0.184)
Healthcare-associated infection	-0.016(0.846)	0.010(0.904)	0.529(±0.001)	0.225(0.006)	0.138(0.090)	0.028(0.735)
Medication	-0.102(0.305)	0.095(0.327)	-0.002(0.981)	0.086(0.372)	-0.172(0.076)	0.015(0.876)

Source: the author, 2016.

(a) - reference variable: female sex; (b) - reference variable: elderly people 80 years of age or older; (c) - reference variable: reason for hospitalization. Statistical test - linear regression

The percentage of patients with comorbidities in this study was lower than in a national study.[23] In France, the CCI median score was the same as this study.[25] As far as SAPS II, the national study results were lower than this study[27] and, in Spain, the results were higher, given the older age profile.[29] The dilemma in relation to the decision to admit elderly people to ICUs has generated controversy in the literature, explaining the difference in these results.[18]

The ICU death rate in national[23,26] and international[25] studies was consistent with this study. However, a Brazilian study identified a higher rate[27] and in an international one, the rate was lower.[24] These findings may suggest that the higher the level of development of a country, the lower the ICU mortality rate. However, this rate depends on various factors, such as: patient, health system and severity triage for ICU admission.[9,10]

A study conducted in São Paulo (SP) found 15,054 patient safety incidents and an adverse reaction rate of 15.4%, higher than in this study.[6] It is worth noting that the SP study used observational and prospective methodology, making the identification of incidents and discernment of the occurrence of harm clearer.

Although there is abundant scientific literature on patient safety, studies using the ICPS terminology are in the beginning stages, making comparisons with other realities difficult. A study conducted in ICUs in São Paulo (SP), which only examined moderate/serious adverse events, discovered a total of 183 such events.[18] However, comparison with this study was hindered, due to the difference in methodology applied.

In Sweden, a study detected 41 adverse events,[7] a lower frequency than in this study, as well as less collection time, which may explain the difference. Furthermore, this study occurred in a developed country which favors the prevention of adverse events through better use of safety protocols.[28] Another study conducted in

Saudi Arabia identified 62 incidents in an ICU, tabulated on the basis of a voluntary reporting system.[8] A possible explanation for this difference is that there is still no culture for raising awareness about reporting, resulting in underreporting.[8] A study in ICUs in Spain and Latin America identified 1,424 patient safety incidents during a 24-hour period, which could explain the lower rate of incidents compared to this study.[9]

In relation to the predominance of each incident type, comparison was difficult due to the lack of studies including all patient safety incident types with ICPS terminology. While this study found a higher occurrence of communication-related no harm incidents, a study conducted in university hospitals in São Paulo (SP) identified a prevalence, among no harm incidents, of failures in nursing prescription follow-up.[6] It is also necessary to take into account the difference in the designation of terms, which hindered comparison of these results.

In relation to adverse event types, there was a predominance in the aforementioned study of dermatitis, rashes and pressure sores in 376 (60.%) adverse events.[6] It was found that, despite the precise use of this nomenclature, the number of adverse events identified was equal to those designated in this study as clinical process/procedure adverse events, which were also predominant.

A study conducted in public ICUs in São Paulo (SP) also detected a predominance of clinical process/procedure adverse events, which may be due to the complexity of these sectors and greater use of invasive procedures.[18] The WHO and other studies have pointed out the extent of medication-related patient safety incidents.[30] It is important to note that observational and prospective studies are more likely to identify medication incidents, since failures in the drug preparation and administration process are much clearer. On the other hand, it is common to identify clinical process/procedure adverse events in nursing, where complications with patients are reported. At the same time, the lack of reports of errors in the preparation and/or administration of medication is to be expected.[3]

As far as factors associated with patient safety incidents, another study was consistent with this one, identifying length of stay as a risk factor.[6,18] However, it found that other variables, such as age, sex, nursing work overload, patient severity and comorbidities did not have any influence.[18] It should be pointed out that comparisons with this study are limited, since this study did not classify adverse events according to complexity. The aforementioned study only examined moderate/serious adverse events.[18]

Other studies also found that psychomotor agitation is a behavior that may be related to various risk factors, including clinical.[11,12] National[14] and international[15] studies were also consistent with this one insofar as the association between reason for hospitalization (for surgery) and a higher occurrence of infection-related adverse events, reinforcing the fact that surgical patients are more susceptible to infection than clinical patients. There is a need, therefore, to optimize preventive surgical measures in relation to this type of adverse event.

In regard to medication incidents, the literature on the topic of nursing practices found that there are various associated factors, such as excessive workload, stress, medical prescription failures and lack of knowledge.[17] Although this study identified a relationship between elderly patients (from 60 to 79 years old) and this type of patient safety incident - but not among patients older than this - none of the studies in this review analyzed age as a contributing factor.[17] This indicates that the variables investigated in this study were perhaps not sufficient to explain this association.

Although in this study there were increased nutrition-related no harm incidents among men, it is difficult to comprehend this finding on its own, since the nutrition incidents examined were related to late enteral feeding deliveries, extended length of time fasting; prolonged length of time without parenteral feeding; and enteral feeding administered to lactose intolerant patients. In addition, the analysis of the influence of the female sex variable on increased adverse events related to administration was also not very clear, since this type of adverse event

was tabulated according to the number of suspensions of ICU-A discharges due to lack of beds in the wards. The association between the low comorbidity rate and no harm incidents related to nutrition and medication was also not understandable, considering the characterization of these patient safety incidents in this study. This fact indicates the need for further studies about these variables to determine their real influence on the occurrence of patient safety incidents.

As far as the limitations of the study, reviews of medical records depend on the quality of the information they contain, and the real number of these incidents may be underestimated. Despite controlling standardization of the data, collections carried out by one person may underestimate the number of patient safety incidents. Nevertheless, the results can serve as input for safety planning for critically-ill elderly people; they also helped move forward the standardization of patient safety incident terminology for comparisons with other realities, in addition to contributing to improved clinical practices.

Conclusion

It is understood that the contributions of this study to clinical practices should be based on strategies to reduce documentation-related no harm incidents and clinical process/procedure-related adverse events, since they were predominant among the incident types and can lead to serious consequences in patients. Attention should especially be paid to searching for strategies to reduce the length of time of elderly people in ICUs, since this proved to be the main risk factor for the occurrence of patient safety incidents. It is also understood that the reasons for hospitalization (for clinical purposes) had a bearing on behavior-related patient safety incidents, showing the importance of optimizing the management of clinical conditions in order to reduce these incidents. Hospitalization for surgical reasons was also linked to increased healthcare-associated infections, calling attention to the need for improved sterilization measures in surgical procedures. The findings in regard to the male/female sex variable and comorbidity rate also indicated the need for more standardized studies to understand their real influence on patient safety incidents. In sum, this study contributed to the planning of clinical practices to enhance the safety of elderly patients and the quality of care in ICUs. It also made headway in the use of WHO terminology and understanding the need for more scientific evidence using this standardization in order to make comparisons with other realities.

Collaborations

Barcelos RA and Tavares DMS collaborated with the project conception, data analysis and interpretation, critical review of the intellectual content and approval of the final version to be published.

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