

## INCIDENTS RELATED TO HEALTH CARE IN AN EMERGENCY HOSPITAL

Incidentes relacionados à assistência à saúde em um hospital de emergência

Incidentes relacionados con la atención de salud en un hospital de emergencia

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### ABSTRACT

**Objectives:** to analyze the notifications of incidents related to health care in a hospital of urgency and emergency. **Methods:** analytical cross-sectional study, consisted by the incident notification forms, recorded by the Patient Safety Center, from January 2017 to June 2018. Simple and multiple logistic regression tests were applied, which associated the variable “damage to the patient” to one or more factors. **Results:** 385 notifications were recorded, 53% were incidents with damage. There was a prevalence of events classified as “other” (30.9%) and “procedural failures” (17.9%). The data demonstrated a statistical association between the occurrence of an event with damage and death. **Conclusion:** efforts aimed at training professionals to become aware of the correct notification processes, practices for preventing incidents and promoting patient safety become essential.

**DESCRIPTORS:** Patient safety; Safety management; Quality of health care; Notification; Emergency medical services.

### RESUMO

**Objetivos:** analisar as notificações de incidentes relacionados à assistência à saúde em um hospital de urgência e emergência. **Métodos:** estudo transversal analítico, com as fichas de notificação de incidentes registradas pelo Núcleo de Segurança do Paciente, no período de Janeiro de 2017 a Junho de 2018. Foram aplicados testes de regressão logística simples e múltipla, os quais associaram a variável resposta “dano ao paciente” a um ou mais fatores. **Resultados:** das 385 notificações, 53% foram incidentes com dano. Houve prevalência de eventos classificados como “outros” (30,9%) e das “falhas de procedimento” (17,9%). Os dados demonstraram associação estatística

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entre ocorrência de evento com dano e o óbito. **Conclusão:** tornam-se imprescindíveis esforços voltados à capacitação dos profissionais para o conhecimento dos processos corretos de notificação, das práticas para prevenção de incidentes e promoção da segurança do paciente.

**DESCRITORES:** Segurança do paciente; Gestão da segurança; Qualidade da assistência à saúde; Notificação; Serviços médicos de emergência.

## RESUMEN

**Objetivos:** analizar las notificaciones de incidentes relacionados con la atención de salud en un hospital de urgencia y emergencia. **Métodos:** estudio transversal analítico, compuesto por los formularios de notificación de incidentes, registrados por el Centro de Seguridad del Paciente, desde enero de 2017 hasta junio de 2018. Se aplicaron pruebas de regresión logística simples y múltiples, que asociaron la variable “daño al paciente” a uno o más factores. **Resultados:** se registraron 385 notificaciones, el 53% fueron incidentes con daños. Hubo una prevalencia de eventos clasificados como “otros” (30,9%) y “fallas de procedimiento” (17,9%). Los datos demostraron una asociación estadística entre la ocurrencia de un evento con daño y muerte. **Conclusión:** los esfuerzos dirigidos a capacitar a los profesionales para que sean conscientes de los procesos de notificación correctos, las prácticas para prevenir incidentes y promover la seguridad del paciente se vuelven esenciales.

**DESCRITORES:** Seguridad del paciente; Administración de la seguridad; Calidad de la atención de salud; Notificación; Servicios médicos de urgencia.

## INTRODUCTION

Discussions on patient safety, risk management and care quality improvement have gained increasing importance worldwide, and have occupied a prominent role within hospital organizations, especially in the prevention and control of healthcare-related events and in the development of a culture that focuses on patient safety.<sup>1-2</sup>

During health care, patients may be exposed to adverse events (AE), which can lead to injury, impairment and temporary or permanent disability, physical dysfunction, psychosocial, prolonged length of stay and even death.<sup>3-5</sup>

The failures associated with assistance have affected countries at different levels of development. Worldwide, an estimated 42.7 million AEs occur annually.<sup>6</sup> In developed countries, data indicate that one in six hospitalized patients is the victim of some incident related to failures in patient safety.<sup>5</sup> The situation is aggravated in developing countries, where there is little evidence, and where millions of patients possibly suffer disabling injuries or die from AEs.<sup>7-9</sup>

In Brazil, discussions on patient safety began in 2002 with the creation of the Brazilian Network of Sentinel Hospitals by the National Agency of Sanitary Monitoring (Agência Nacional de Vigilância Sanitária - ANVISA).<sup>10</sup> In 2009, the Notificação e Investigação em Vigilância Sanitária (Notivisa) was implemented, which enabled better control and monitoring of failures nationwide, and in 2013, through Ordinance No. 529, the National Patient Safety Program (Programa Nacional de Segurança do Paciente - PNSP) was instituted as a strategy for monitoring and preventing welfare damage.<sup>10-11</sup> Later, there was the publication of RDC 36/2013, which implemented the Patient Safety Nucleus (Núcleos de Segurança do Paciente - NSP) for the fulfillment of goals,

surveillance, monitoring, notification, continuing education, control and prevention of risks related to assistance.<sup>3-4</sup>

The literature points out that incident reporting and analysis is an extremely useful tool for risk management, surveillance and monitoring. The data obtained from the notifications can generate information that allows the institutions to develop strategies to face the identified problems, aiming at improving the quality of care and promoting patient safety.<sup>2,7</sup>

Despite the advances, there are still organizational, structural, educational and professional problems, which reflect in the occurrence of assistance flaws and which limit the process of collecting and systematizing this information. In the hospital context, there is a need for the development of interventions that include efficient notification systems, analysis and follow-up of incidents, and educational processes that encourage professionals to recognize the event, the damage, and proper notification.<sup>1,7,12-14</sup>

Faced with this challenge, in a context of care management, promotion of care quality and patient safety, the study aims to analyze the notification of incidents related to health care in an emergency hospital.

## METHODS

This is a cross-sectional analytical study of secondary data, conducted in a hospital of high complexity, with 425 beds, in the city of Belo Horizonte - MG.

The study sample comprised all the notification forms registered with the NSP in the period from January 2017 to June 2018. The data were obtained through an electronic database provided by NSP of the institution. Notifications that did not present the patient's registration number were excluded, as it was impossible to search for additional information in the electronic record.

The variables were studied:

- 1) Response: patient damage (incidents without damage, incidents with damage/EA, incidents where you do not know if damage has occurred).
- 2) Patient-related: age, gender, main clinic, length of hospital stay after the event, total length of hospital stay, final outcome (discharge, death, transfer).
- 3) Related to the incident: sector of occurrence, category of the event (group and subgroup), time of occurrence of the event after hospital admission, time of notification of the event to Notivisa, actions taken after the identification and notification of the event, identification of the notifying professional (yes, no).

For better understanding, the incidents were categorized into groups and subgroups according to the institution's standardization, based on ANVISA guidelines,<sup>3,11</sup> in events related to: 1) Equipment and medical material; 2) Transfusion process; 3) Medication chain; 4) Skin injury; 5) Fall; 6) Failure in patient identification; 7) Failure in documentation; 8) Failure in ventilatory support; 9) Loss, obstruction, displacement of invasive devices; 10) Failure in procedure; 11) Surgical failure; 12) Others.

In order to improve the quality of the data to be analyzed, a review of the electronic database provided by NSP was

performed, besides the collection of additional information through the printed notification forms filed and the electronic patient's records.

The data were restructured in Microsoft Excel® 2010 and later exported to IBM® Statistical Package for the Social Sciences (SPSS) software version 24.0. The descriptive statistical analysis was performed by means of observed and relative frequency, central tendency measures and dispersion. Simple and multiple logistic regression tests were applied, which associated the response variable "patient damage" with one or more factors. The odds ratio (OR) was also reported to quantify these associations. The level of significance adopted in the analyses was 5% ( $p \leq 0.05$ ).

The ethical procedures in research were followed according to Resolution No. 466 of December 12, 2012, of the National Health Council. The research project was approved by the Research Ethics Committee on June 7, 2018, under opinion 2,698,416 and CAAE 90734418,8,0000,5119.

## RESULTS

In the institution under study, incident notifications are made on a voluntary basis, through the manual completion of notification forms.

In the period under study 390 notifications were registered, and there was sample loss of five notifications. Of the 385 notifications analyzed, 285 (74%) were incidents with male patients and 100 (26%) were female. The average age was 42.6 years (SD 22.1). About the clinical specialty, 128 (33.2%) patients were under the care of neurosurgery, 56 (14.5%) general surgery and 55 (14.3%) orthopedics. Most of the notifications were registered by the Surgical Block 96 (24.9%) and Intensive Care Unit- Adult ICU 85 (22%). The detailed results are presented in Table 1.

**Table 1** - Epidemiological and clinical profile of incidents recorded in an Emergency and Emergency Hospital - January 2017 to June 2018. Belo Horizonte, MG, Brazil, 2019

	Variable	n	%
<b>Sex</b>	Male	285	74
	Female	100	26
<b>Main Clinic</b>	Neurosurgery	128	33,2
	General Surgery	56	14,5
	Orthopedics	55	14,3
	Plastic Surgery	52	13,5
	Medical Clinic	40	10,4
	Toxicology	15	3,9
	Pediatrics	14	3,6
	Cardiovascular Surgery	9	2,3
	Hand Surgery	4	1
	Otolaryngology	4	1
	Oral and Maxillofacial Surgery	3	0,78
	Other/uninformed	3	0,78
Ophthalmology	2	0,52	

	Variable	n	%
<b>Sector of occurrence</b>	Surgical Block	96	24,9
	Adult ICU	85	22
	Ambulatories	65	16,9
	Traumatic Emergency Room	46	11,9
	Radiology	39	10,1
	Hospitalization	19	4,9
	Other/uninformed	16	4,2
	Clinical Emergency Room	13	3,4
	Pediatric ICU	6	1,5

The incidents occurred, on average, 7.5 days (SD 17.1) after hospital admission. After the event, the patients had, on average, another 19.8 days (SD 30.5) of hospitalization. The mean total length of hospital stay was 27.3 days (SD 37.6). The mean time between the occurrence of the event and its notification to Notivisa was 22.7 days (SD 11.3).

Regarding the type of incident, 119 (30.9%) were classified as "other", 69 (17.9%) as "procedural failures". The "failures during health care" was the subgroup with the highest prevalence, comprising 148 (37.9%) of the total notifications. The detailed results for the groups and subgroups of the incidents are presented in Table 2.

**Table 2** - Groups and subgroups of incidents reported in an Emergency and Emergency hospital - January 2017 to June 2018. Belo Horizonte, MG, Brazil, 2019

	Category of events (groups and subgroups)	N	%
<b>Medical equipment/material</b>	Technical complaint of hospital equipment/material/technology	16	100
		<b>16</b>	<b>4,2</b>
<b>Failure of procedure</b>	Related to the surgical process	11	15,9
	Failure during patient transfer and transport	8	11,6
	Failures during health care	30	43,5
	Loss/Exchange of biochemical or laboratory sample	8	11,6
	Iatrogenic Pneumothorax/Barotrauma	7	10,1
<b>Failure in documentation</b>	Related to vascular access puncture	2	2,9
	Related to airway access	3	4,3
		<b>29</b>	<b>7,5</b>
<b>Failure to identify</b>	Related to the medical record	28	96,5
	Unspecified/Uninformed	1	3,5
<b>Failure to identify</b>	Related to identification bracelet or bedside identification	16	100
		<b>16</b>	<b>4,2</b>

Category of events (groups and subgroups)	N	%
<b>Transfusion process failure</b>	<b>2</b>	<b>0,52</b>
Unavailability and wrong identification of the blood component	2	100
<b>Skin injury</b>	<b>24</b>	<b>6,2</b>
Pressure Injury (PI)	9	37,5
Corneal injury/Parasite injury/Other injuries	5	20,8
Injury associated with mechanical containment/medical devices	10	41,7
<b>Others</b>	<b>119</b>	<b>30,9</b>
Failures during health care	117	98,3
Unspecified/Uninformed	1	0,84
Suicide	1	0,84
<b>Invasive device loss/blocking</b>	<b>43</b>	<b>11,2</b>
Accidental intravascular device loss/abstraction	28	65,1
Loss/abstraction of drains and probes	15	34,9
<b>Fall</b>	<b>16</b>	<b>4,2</b>
Bed/chair/own height	16	100
<b>Medication chain</b>	<b>33</b>	<b>8,6</b>
Wrong/unmanaged dose	12	36,3
Inadequate identification / labelling	3	9,1
Wrong medication	6	18,2
Wrong Patient	1	3
Wrong prescription	5	15,2
Wrong route of administration	3	9,1
Unspecified/Uninformed	3	9,1
<b>Ventilatory support</b>	<b>18</b>	<b>4,7</b>
Failures during health care	1	5,5
Loss/obstruction of respiratory devices (TQT, TOT)	3	16,6
Iatrogenic Pneumothorax/Barotrauma	2	13,3
Reintubation in less than 24 hours	12	66,6
<b>TOTAL</b>	<b>385</b>	

Regarding the final outcome, 264 (68.5%) patients were discharged and 121 (25.5%) died.

In 204 (53%) notifications, the incident generated damage to the patient. Of these, 62 (30%) died, being: two (3%) deaths immediately after the occurrence of the AL; two (3%) one day after the AL; and eight (13%) from two to ten days after the AL. In 112 (29%) notifications, the notifiers did not know how to evaluate if there was damage to the patient, of these, 28 (25%) evolved to death. In 69 (18%) it was pointed out that there was no damage to the patient, of these, eight (12%) evolved to death.

In the analysis of the relationship between the response variable “incident with damage/EA” and the final outcome “death”, a statistically significant relationship was observed ( $p=0.020$ ;  $OR=2.9$ ). Thus, patients who suffered AE have 2.9 more chances of evolving to death, when compared to patients who suffered incidents without damage. The other variables were not considered risk factors or protection for the final outcome.

In the analysis of the relationship between the response variable “incidents that do not know if there was damage” and the final outcome “death”, the results point to a statistical association ( $p=0.015$ ;  $OR=3.9$ ). Patients who suffered incidents in which the notifier could not determine the presence of damage have 3.9 times more chances of death, when compared to incidents without damage. This variable also presented association with the sector of notification - Unit of hospitalization ( $p=0.018$ ). The notifications made by professionals of the hospital unit are more likely not to know if there was damage to the patient, when compared to events that occurred in other sectors.

About the conducts taken after the incident occurrence, 142 (37%) notifications indicated that there was orientation and (or) training of the professional or team involved, 120 (31%) conducted notification/orientation of the sector/coordination and 123 (32%) did not inform.

In 243 (63%) of the notifications, the notifying professional identified himself.

## DISCUSSION

It is known that welfare incidents are underreported in Brazil, and possibly this study portrays this reality. The literature points out that underreporting is associated with factors such as: the notification system used, the passive and voluntary methodology, lack of knowledge, feeling of guilt or fear, and not adherence to the patient’s safety culture.<sup>2,13-15</sup>

A study that compared the notification methodologies pointed out a greater adhesion of professionals to the computerized method, in which the notifier is identified. The fact was explained by the safety culture adopted by the institution. In addition, the use of a computerized system can facilitate and speed up the notification process.<sup>7</sup> However, regardless of the methodology chosen, the important thing is to ensure that it is accessible, easy, clear and unbureaucratic.<sup>14</sup>

There is a pattern in the epidemiological and clinical profile of patients that follows the results of studies conducted in emergency hospitals. Traumatic emergencies are one of the external causes that most leads to morbidity and mortality, especially among young men.<sup>16-17</sup>

The Surgical Block and the adult ICU were the sectors that most notified. Studies indicate that the characteristics of these sectors are correlated with the highest number of incidents, since they are critical units, which participate in numerous processes of assistance to critically ill patients and use a large number of inputs, materials and technologies. Such factors make the professionals there have a better capacity of observation, perception, evaluation and notification of incidents.<sup>13,18</sup>

Regarding the time for the incident to occur, a similar result was found in the literature, on average, 10 days from the date of hospital admission.<sup>17</sup> Patients with a period of hospitalization of nine days or more are 34 times more likely to have EA than those with a shorter period.<sup>19</sup> In the context of emergency care, patients have a high length of hospitalization due to clinical conditions and greater need

for diagnostic-therapeutic interventions, thus increasing the risk for incidents to occur.<sup>20-21</sup>

There is a strong relationship between the occurrence of incidents and the prolongation of the length of stay. It is estimated an increase of 20 to 30 days of hospitalization.<sup>21-22</sup> The extension in the period of hospital stay, besides the financial impacts, increases the patient's exposure to the welfare risks, leaving him/her more vulnerable to the occurrence of new incidents.<sup>21-22</sup>

After the incident has occurred, the NSP must report to the Notivisa System within 72 hours the deaths related to environmental education, and by the 15th working day of the following month the other incidents.<sup>10</sup> A Brazilian study on environmental education that resulted in death indicated that, on average, the NSP takes 63 days to report the incident.<sup>13</sup> Meeting the deadlines set allows the NSP to act better by stimulating active search and risk monitoring.<sup>10</sup> The use of a computerized notification system can contribute to speeding up the process, enabling early recognition by the NSP and timely decision making.<sup>7</sup>

Most incidents have been classified as "other," "procedural failures," and "failures during health care," which has also been identified in other studies.<sup>13,23</sup> The non-specificity of these classifications limits recognition of the actual scenario of health care incidents. The literature points out that problems related to the notification form, the lack of clarity in the description of incidents, and gaps in professionals' knowledge of the concepts, descriptions, and terminologies on the notification form compromise the notification process.<sup>13-14,23</sup>

When identifying incomplete, badly described or incorrectly classified events, the NSP is expected to follow up by means of an active search in medical records and with the professionals involved in the event, and when necessary, the reclassification of these events should be conducted. From these interventions it will be possible to recognize the real causes and circumstances of the event, enabling specific interventions and the search for improvements that ensure patient safety. In addition, it is necessary to rethink the notification methodology adopted, in view of the need to minimize generalities and guarantee the quality of the data described in the notifications.<sup>4</sup>

In Brazil, effective studies demonstrating the real lethality of environmental education and the impacts of the damage generated are still scarce, especially by the methodology of notification and monitoring adopted by the institutions.<sup>13</sup> In this study it was observed that most incidents generated damage to the patient, and that there was a statistically significant association between the occurrence of environmental education and mortality. The literature already shows that the occurrence of environmental education implies an increased chance of death.<sup>21</sup> The data reinforce the serious problem of environmental education and the need for actions focused on the care process and reduction of incidents.

The results also point to the need for training and sensitization of professionals regarding the recognition of damage. This study observed an association between incidents in which damage and mortality were not known. Although the notification form used by the institution allows professionals

to point out that they do not know if there was damage, it is essential that NSP actively investigates events classified as such, due to the potentiality of evolving with damage and unfavorable outcome to the patient.<sup>4</sup>

The lack of clarity regarding the damage may compromise the assistance and follow-up that will be provided to the patient. Analyzing and correctly understanding the damage generated allows the team to review practices, plan and improve care, intervene early and in a timely manner in the complications generated and prevent the occurrence of new incidents.<sup>1-2,13</sup> Additionally, the punitive view that notification still generates in professionals, may be the contributing factor to omission of the real damage caused. Fostering lifelong education strategies, patient safety, and the deconstruction of punitive vision can contribute to improving the qualitative and quantitative quality of notifications.<sup>2,14</sup>

The literature points out that incidents without damage are less reported, although they occur more frequently within institutions. The fact that the incident has not caused harm to the patient does not diminish its importance and the need for notification and investigation. Its registration should be encouraged, as it allows the recognition of the institution's weaknesses and the implementation of preventive measures that ensure the quality of care.<sup>14</sup>

In relation to the behaviors adopted after the incident, it is noticed that in general, the services use a personal approach to solve the failures, which is already clearly described in the literature as not being the most effective strategy.<sup>9,11</sup>

After the identification and communication of an incident, a broad action plan with a systemic approach must be structured, based on the identification of the main causes, risks involved, weaknesses and contributing factors.<sup>1,11</sup> In this process, it is essential that the event be analyzed from the perspective of failures in work processes, occupational problems, infrastructure and technology, and that, in addition to the care team, managers, coordinators and managers are also involved.<sup>1,9,24</sup> These behaviors can help in the development of strategies to qualify care security and reduce risks to patients.

This study presents as limitation the number of notified incidents, especially because the notifications are passive and assistematic. Limitations in the notification instrument are also noticeable, which induces generalized classification of incidents. It is suggested, the development of studies with longitudinal design, for producing better evidence, favoring the identification and analysis of incidents, damages and their repercussions.

## CONCLUSION

The occurrence of welfare incidents represents a serious problem for health services, especially for the association of events with damage and death. Despite this finding, underreporting is still a reality. In this study, underreporting could be inferred, especially when considering the characteristic of emergency and emergency care.

The study made it possible to conclude about the real necessity of establishing methodologies that assure notifications with better quality of filling, that are reported more quickly, that there is a prospective follow-up of the

incidents and their victims, besides the development of educative and preventive actions effective, especially with the nursing team that participates actively of these processes.

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