

# Iatrogenesis in hospitalized elderly: an exploratory-descriptive study

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## Abstract

This study analyzes the occurrence of iatrogenesis related to nursing care with hospitalized elderly at a teaching hospital. It is a documentary and retrospective exploratory-descriptive study that investigated 100 medical records, of which 54% related to patients in the age range between 60 and 70 years, 56% males, strokes being the most frequent cause of hospitalization (7%). Eleven iatrogenic events were identified, of which five occurred in the emergency sector. All the cases observed were identified by the nursing team. Risk of falls was the prevalent iatrogenic possibility, appearing in 17% of medical records. It is concluded that it is necessary to intensify the dissemination of the concept of iatrogenesis in the hospital environment and to emphasize the importance of notification to prevent it.

**Keywords:** Iatrogenic disease. Nursing care. Old age assistance.

## Resumo

### Iatrogenias em idosos hospitalizados: estudo exploratório-descritivo

Este trabalho analisa a ocorrência de iatrogenias relacionadas ao cuidado de enfermagem em idosos internados em hospital de ensino. Trata-se de estudo exploratório-descritivo, do tipo documental e retrospectivo, que averiguou 100 prontuários, dos quais 54% diziam respeito a pacientes em faixa etária entre 60 e 70 anos, 56% do sexo masculino, sendo o acidente vascular cerebral a causa de internamento mais frequente (7%). Identificaram-se 11 ocorrências de iatrogenia, das quais cinco aconteceram no setor de emergência. Todos os casos observados foram identificados pela equipe de enfermagem. Risco de queda foi a possibilidade iatrogênica prevalente, constando em 17% dos prontuários. Conclui-se que é preciso intensificar a divulgação do conceito de iatrogenia no ambiente hospitalar e enfatizar a importância da notificação para preveni-la.

**Palavras-chave:** Doença iatrogênica. Cuidados de enfermagem. Assistência a idosos.

## Resumen

### Iatrogenias en ancianos hospitalizados: un estudio exploratorio-descriptivo

Este trabajo analiza la ocurrencia de iatrogenias relacionadas con la atención de la enfermería en ancianos internados en un hospital de enseñanza. Se trata de un estudio exploratorio-descriptivo, de tipo documental y retrospectivo, que analizó 100 prontuarios, de los cuales el 54% eran de pacientes en una franja etaria de entre 60 y 70 años, el 56% de sexo masculino, siendo el accidente cerebrovascular la causa más frecuente de internación (7%). Se identificaron 11 ocurrencias de iatrogenias, de las cuales cinco tuvieron lugar en el sector de emergencia. Todos los casos observados fueron identificados por el equipo de enfermería. El riesgo de caída fue la posibilidad iatrogénica prevalente, constando en el 17% de los prontuarios. Se concluye que es necesario intensificar la divulgación del concepto de iatrogenia en el ambiente hospitalario y enfatizar la importancia de la notificación para prevenirla.

**Palabras clave:** Enfermedad iatrogénica. Atención de enfermería. Asistencia a los ancianos.

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The aging process brings with it specific conditions that make the elderly vulnerable. The decrease in mortality, which leads to population aging, is linked to the increase in morbidities, such as chronic noncommunicable diseases, which, when exacerbated, increase the search for hospital care<sup>1</sup>. Not infrequently, hospitalized elderly are treated like any other adult, without considering processes of senescence and senility, which make them vulnerable to iatrogenic acts<sup>2</sup>.

“Iatrogenesis” is defined as an unintentional and detrimental pathological alteration to the patient resulting from the action of the health team, and experts in geriatrics point to it as a serious public health problem<sup>3</sup>. Excessive hours of work, fatigue, lack of attention and of knowledge, stress, affected state of mental health, neglect, recklessness and difficulty (especially for the nursing team) to understand medical prescriptions are factors that can lead to iatrogenesis<sup>4</sup>.

Compared with the other age groups, the elderly have higher rates of hospitalization and longer stays in hospital services. Evidence shows that care for the elderly demands more financial, human, physical and material investments<sup>5</sup>. In relation to human resources, the nursing team is the professional class that interacts the most with patients during their hospitalization<sup>6</sup>. Their duties are many of which increase iatrogenic risks specific to their care, such as errors in drug preparation and administration, poor maintenance of peripheral venous accesses, and pressure lesions in bedridden patients<sup>7</sup>.

A recent study<sup>4</sup> relates negligence, imposition or imprudence in the provision of nursing care to iatrogeneses, cases that may cause disruption, damage or impairment to human well-being in an institutional environment. Iatrogenic acts must be reported, but the punitive culture, which arouses fear of possible ethical-legal sanctions in the professional leads to underreporting<sup>8</sup>.

Knowledge of this theme is important because its disclosure allows nursing teams to reflect on the care of the hospitalized elderly, in order to stimulate greater efficiency and faster recovery, with the return of the individual to his daily life in less time. In view of the above, this study aims to analyze iatrogeneses related to nursing care in the elderly hospitalized in a teaching hospital.

## Methods

This is an exploratory-descriptive, documentary and retrospective study, with a quantitative

approach, carried out with medical records of the elderly hospitalized in a teaching hospital in the state of Ceará, Brazil, in the six months immediately prior to the beginning of data collection in December 2015. After searching the information system of the hospital and filtering the results to consider only individuals over 60 years of age, 1,423 medical records were identified. The initial intention was to analyze all of them, but due to institutional restrictions, related to the large quantity found and limited human resources to locate them, the Medical and Statistical Office of the institution was requested to select 100 medical records at random.

The selected sample was submitted to a documentary analysis between December 2015 and January 2016. This stage was carried out by three previously trained researchers who used a script prepared by the authors based on evidence found in a study that aimed to identify the main iatrogeneses by nurses in the elderly hospitalized in a university hospital in Campinas, a city in the interior of the state of São Paulo<sup>9</sup>. The analysis instrument included the following information: age, sex, unit, period and reason for hospitalization, and iatrogenic record, identified by the in-depth reading of nursing notes.

During the analysis of the records, it was possible to identify conditions and factors that were not characterized as iatrogeneses but as risks. Thus, these factors were qualified using information in the records about procedures and nursing care performed and using a simple calculation of hospitalization time to verify the iatrogenic potential.

The collected data were organized into tables and analyzed based on descriptive statistics. The findings were represented as percentages and absolute numbers. The inferences were examined in light of the literature on the subject. In addition, ethical aspects provided for in Resolution CNS 466/2012<sup>10</sup> were respected regarding research involving human beings.

## Results and discussion

Of the 100 charts included in the sample, 56% were of male and 44% of female patients, with 54% of the elderly aged between 60 and 70 years, 30% between 71 and 80 years, 13% between 81 and 90 years and finally 3% were 91 years old or above. Table 1 shows the affected human body systems that led to hospitalization, related to the patient's age and gender.

There are several reasons that lead the elderly to seek hospital care. Thus, Table 1 informs the causes of hospitalization of the selected sample. Prevalence of problems related to the cardiovascular and reproductive systems was observed, totaling 37 hospitalizations. In these, hospitalizations of male subjects predominated (62%).

Data from the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística, IBGE)<sup>11</sup> list stroke, heart failure and pneumonia as some of the leading causes of hospital admission in the elderly male population. Lack of

information and prejudice against preventive exams may explain the large number of diagnoses related to the cardiovascular and reproductive systems in this group<sup>12</sup>. As for female individuals (38%), neoplasias, especially of the breast and cervix, data from the online Atlas of mortality from the National Cancer Institute still point to these diagnoses as one of the leading causes of death in women<sup>13</sup>. Once the study sample was categorized, the medical records were examined for evidence of iatrogenic events, and it was possible to identify 11 occurrences. Table 2 shows the distribution by age group and sex.

**Table 1.** Systems of the human body affected, responsible for hospitalization, by age group and sex

System of the human body	Age group (in years) by sex								Total
	60 to 70		71 to 80		81 to 90		91 or above		
	M	F	M	F	M	F	M	F	
Cardiovascular	6	5	5	2	1	–	–	–	19
Reproductive	4	5	6	2	1	–	–	–	18
Skeletal	8	–	–	3	–	2	1	–	14
Urinary	3	5	1	–	1	1	1	–	12
Digestive	1	6	2	2	–	–	–	–	11
Respiratory	2	–	1	1	1	1	–	–	6
Muscular	3	2	–	–	–	–	–	–	5
Nervous	–	1	–	2	–	2	–	–	5
Integument	–	–	2	–	1	–	1	–	4
Excretory	–	1	–	–	–	–	–	–	1
Others	2	–	1	–	1	1	–	–	5
<b>Total</b>	<b>29</b>	<b>25</b>	<b>18</b>	<b>12</b>	<b>6</b>	<b>7</b>	<b>3</b>	<b>–</b>	<b>100</b>

M: masculine; F: feminine

**Table 2.** Iatrogenic events according to age group and sex

Iatrogeneses	Age group (in years) by sex								Total	
	60 to 70		71 to 80		81 to 90		91 or above		FI	FR
	M	F	M	F	M	F	M	F		
Infiltration, obstruction or phlebitis in peripheral venous access before 72h	1	–	1	–	1	–	–	–	3	27%
Pressure Injury	–	–	–	–	–	1	–	–	1	9%
Loss of nasogastric tube	–	–	–	–	1	1	–	–	2	18%
Allergic drug reaction	1	1	–	1	–	–	–	–	3	27%
Loss of bladder catheter	–	–	1	–	–	–	–	–	1	9%
Obstruction of hemodialysis catheter	–	–	–	–	1	–	–	–	1	9%
<b>Total</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>–</b>	<b>–</b>	<b>11</b>	<b>100%</b>

M: masculine; F: feminine; FI: absolute frequency; FR: relative frequency

The observed predominance of iatrogeneses in male patients leads to the reflection on the behavior, still common in this group, of seeking health services when it is no longer possible to ignore the condition<sup>14</sup>. This usually leads to the intensification of the problem, increasing the period of

hospitalization and exposing the patient for a longer time to the actions of health professionals. With this in mind, it was possible to relate the occurrence of iatrogeneses to the time of hospitalization and to the hospital sector where they occurred, as shown in Table 3.

**Table 3.** Iatrogenic events according to the length and the sector of hospitalization

Iatrogenesis	Sector of hospitalization	N	Length of stay/event
Infiltration, obstruction or phlebitis in peripheral venous access before 72h	Medical clinic	1	21 days
	Emergency	2	23 days
			9 days
Pressure Injury	Infection Unit	1	10 days
Unplanned removal of nasogastric tube	Emergency	2	12 days
			7 days
Allergic drug reaction	Infection Unit	1	39 days
	Medical clinic	1	24 days
	Emergency	1	2 days
Unplanned removal of the bladder catheter	Oncology	1	3 days
Obstruction of the central venous hemodialysis catheter	Hemodialysis	1	21 days
<b>Total</b>		<b>11</b>	<b>Average hospitalization time: 16.4 days</b>

Of the 11 cases of iatrogenesis, 82% occurred in the elderly with hospitalization time between 7 and 39 days. Only two (18%) referred to the elderly who were hospitalized for less than one week. The sectors that registered iatrogenic acts were: emergency, with five occurrences (45%); medical clinic and infection unit, with two occurrences each (18%); and oncology and hemodialysis units, with one occurrence each (9%). The mean time of hospitalization was estimated at 16.4 days, ranging from 39 days in the infection unit to two days in the emergency room.

These data allow relating iatrogenesis and hospitalization time, inferring that the permanence in a hospital environment and the submission to continuous actions by the entire professional team responsible for care increase the vulnerability of the elderly. Thus, the longer the treatment period, the greater the likelihood of iatrogenic<sup>15</sup>.

It was also sought to verify the behavior of the professionals regarding the recognition of the occurrence (Table 4). It can be verified that the nursing team was responsible for identifying and recording all iatrogeneses: of the total, the nurse practitioner identified 4 occurrences, and the nursing technician pointed out 7. Most iatrogenic occurrences are linked to acts of responsibility of the nursing team, leading, therefore, to reflect on this relationship.

Nurses are the professional class that remains with the patient at all times, and such proximity, with an overload of work, compromises the acuity of the team, making it more susceptible to errors<sup>16</sup>. Thus, it is necessary to assess the team periodically to avoid or at least minimize the overload of each professional.

In this study, it could be observed that iatrogeneses related to peripheral venous access (PVA) and administration of medications are among the most frequent. In order for the proposed therapeutic goals to be achieved, it is important to have good maintenance of the patient's PVA, one of the many tasks of the nursing team. The same occurs with the preparation and the application of medications, since the adverse events that occurred in this process, including drug allergic reaction, configure iatrogenic nursing care<sup>7</sup>. Thus, attention to the medical prescription and good communication between the nursing team and with the patient, who may report preexisting drug restrictions, are essential to reduce the occurrence of this type of error.

The iatrogeneses identified after analysis of the nursing records correspond to 10% of the total number of records analyzed, since 11 cases were found, and two of them were verified in the same file.

This allows theorizing about possible underreporting, probably due to the fear of punishment for error or even the lack of knowledge of the importance of registration, essential also for legal support<sup>8</sup>. After identifying the error, the nursing professional can act according to their competence and, when this is not the case, communicate the fact to the other team members who are able to correct it.

As Table 4 shows, the iatrogenic drug allergic reaction, which occurred three times in the cases examined, was identified by the nursing team. However, since it is not their role to prescribe medications or suspend them, the team limited itself to communicating the responsible professional, just as occurred in the case of catheter obstruction for hemodialysis, since the replacement of the catheter is not the responsibility of the nurse.

A total of 42 risk factors for iatrogenesis were identified in the 100 records analyzed in 31

elderly people. Of these, nine (29%), according to the interpretation of the nursing evolutions in the medical records, presented two or more factors. The main perceived risks are those of fall and pressure injuries, which correspond to 40% and 33% of the identified risk factors, respectively. Table 5 describes all cases of risk identified in this study.

Elderly people are affected by processes common to old age that can weaken them and limit their autonomy<sup>17</sup>, such as diseases of the joints and bones - osteoporosis, arthritis and arthrosis, for example. These individuals may have difficulty walking and may even be restricted to the bed, which explains, in most cases, the prevalence of the risks of fall and pressure injury. It is part of the nursing care to attend to these possible diagnoses in order to prevent them, basing their practices on scientifically proven references since this contributes to consolidate nursing as a care science<sup>18</sup>.

**Table 4.** Iatrogeneses identified by professional category and procedure

Iatrogeneses	Professional who identified		Procedure
	Nurse	Nursing technician	
Infiltration, obstruction or phlebitis in peripheral venous access before 72h	–	3	Change peripheral venous access
Pressure Injury	1	–	Make dressing
Unplanned removal of nasogastric tube	1	1	Redo the procedure
Allergic drug reaction	–	3	Tell the physician, who will stop the medication
Unplanned removal of bladder catheter	1	–	Redo the procedure
Obstruction of hemodialysis catheter	1	–	Tell the physician, who exchanges the catheter

**Table 5.** Risks of iatrogenesis related to gender, age group and mean hospitalization time

Risks	Age groups (in years) and sex								Total	Mean Hospitalization time
	60 a 70		71 a 80		81 a 90		91 ou mais			
	M	F	M	F	M	F	M	F		
Fall	6	3	3	3	1	–	1	–	17	6,6 days
Pressure injury	5	2	3	2	1	1	–	–	14	7,1 days
Unplanned removal of nasogastric tube	–	1	2	–	–	1	–	–	4	11,5 days
Unplanned removal of bladder catheter	–	1	1	–	–	1	–	–	3	8 days
Contention injury	–	–	1	1	–	–	–	–	2	7,5 days
Drug administration by an incorrect route	–	1	–	–	–	–	–	–	1	3 days
Adverse drug reaction	1	–	–	–	–	–	–	–	1	7 days
<b>Total</b>	<b>12</b>	<b>8</b>	<b>10</b>	<b>6</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>–</b>	<b>42</b>	<b>6,2 days</b>

M: masculine; F: feminine

## Final considerations

When seeking care in a hospital, the elderly seek to solve their health problem. In addition to coping with various comorbidities common to this stage of life, people in this age group are in a state of greater vulnerability, which can make them victims of iatrogenesis. Therefore, seeking and implementing strategies to reduce the length of hospital stay is essential, considering that, as evidenced in this article, length of hospital stay influences the occurrence of iatrogenic acts, as a direct result of the longer period under the care of health care professionals.

Although no professional in this environment is free from the risk of causing iatrogenesis, the nursing class is distinguished by its greater contact with the patient, both in terms of making mistakes and identifying them. The relationship between hospitalization unit and possible work overload also influences the occurrence of iatrogeneses, as observed in the emergency care unit of the hospital selected for this study, where there were five occurrences. One of the strategies to reduce this relationship would be to consider the human resource dimensioning - if not for all units, at least for those in which there is greater demand. With the appropriate delimitation, the workload of the professionals is relieved, which will allow for higher quality care with fewer risks.

The potential iatrogenic factors found in this study questioned the extent to which these data express reality. This is because few professionals register their interventions correctly, showing what and how it was actually done and what interurrences resulted from this process. It should also be pointed

out that the iatrogenic registers mentioned in the present study reported only the attitude taken after its occurrence, without evidence of formal notification.

However, it is understood that this formal registration is the ethical responsibility of any professional who deals with lives, especially of human beings, since their absence, from the ethical-legal point of view, constitutes negligence. Underreporting may be associated with a lack of discussion among the health team about the issue, or may be credited with attempting self-preservation as evidence of the fear of formally communicating some malpractice committed and, thus, becoming punishable.

Disclosing the concept of iatrogenesis, especially related to elderly patients, as well as the importance of its prevention and notification, increases the technical knowledge of the professional about specific procedures in their area, and may reduce the occurrence of errors. In this same discourse, it is reflected in reckless acts, when actions are precipitated and devoid of proper precaution, because nursing procedures with this characteristic contribute to iatrogenic acts. Thus, it is suggested that ethical terms of negligence, malpractice and recklessness are also disclosed by their connection with the entire iatrogenic process.

Thus, this study aims to promote new research on the subject in order to verify strategies that minimize iatrogenesis, reducing the occurrence of sequelae and death of patients. In addition, since health resources are always scarce, it is proposed to reflect on the cost of hospital admission, especially considering complications resulting from the patient's prolonged stay in the institution.

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#### Participation of the authors

Niele Duarte Ripardo planned the study, collected and analyzed data and wrote the article. Maria da Conceição Coelho Brito conceived the theme, performed intellectual review and approved the final version for publication.

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