UFSM

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REVISTA DE ENFERMAGEM DA UFSM

ISSN 2179-7692
Acesso aberto

Rev. Enferm. UFSM, v.12, e4, p.1-16, 2022 • https://doi.org/10.5902/2179769265710
Submission: 5/18/2021 • Acceptance: 11/04/2021 • Publication: 02/15/2022

Original Article

Characterization of reported deaths resulting from complications of medical and surgical care

Caracterização dos óbitos notificados decorrentes de complicações dos cuidados médicos e cirúrgicos

Caracterización de las muertes reportadas como resultado de complicaciones de la atención médica y quirúrgica

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Abstract

Objective: describing the cases of deaths reported due to complications of medical and surgical care in Brazil between 2015 to 2018. **Method:** a descriptive and retrospective conducted between June and July 2020 with the records of deaths extracted from the Health Mortality Information System. The data were grouped into two biennia, 2015-2016, and 2017-2018, and analyzed by descriptive statistics and percentage variations. **Results:** there were reported 6,587 deaths, especially the 2017-2018 biennium (n=3,425;52%). Deaths caused using medical equipment reduced in Brazil, with a negative percentage variation of 15.4% among the biennia. There was an increase in deaths from adverse effects of drugs/medications with a positive percentage variation of 12.2%. The number of deaths from accidents during hospital care remained stationary. **Conclusion:** changes were observed in the records of deaths notified in Brazil, and expanding preventive actions aimed at reducing deaths are necessary in all notification groups.
Descriptor: Hospital Mortality; Postoperative Complications; Patient Safety; Delivery of Health Care; Unified Health System

Resumo

Objetivo: descrever os casos de óbitos notificados por complicações de assistência médica e cirúrgica no Brasil entre 2015 a 2018. **Método:** descritivo e retrospectivo conduzido entre junho e julho de 2020 com os registros de óbitos extraídos do Sistema de Informações sobre Mortalidade em Saúde. Os dados foram agrupados em dois biênios 2015-2016 e 2017-2018 e analisados por

estatística descritiva e variações percentuais. **Resultados:** foram notificados 6.587 óbitos, com destaque para o biênio 2017-2018 (n=3.425;52%). Os óbitos ocasionados pelo uso de equipamentos médicos reduziram no Brasil, com variação percentual negativa de 15,4% entre os biênios. Houve aumento das mortes por efeitos adversos de drogas/medicamentos com variação percentual positiva de 12,2%. O número de óbitos por acidentes durante a assistência hospitalar se manteve estacionário. **Conclusão:** observaram-se alterações nos registros de óbitos notificados no Brasil, e expandir ações preventivas que visem reduzir os óbitos são necessárias em todos os grupos de notificação.
Descritores: Mortalidade Hospitalar; Complicações Pós-operatórias; Segurança do Paciente; Assistência à Saúde; Sistema Único de Saúde

Resumen

Objetivo: describir los casos de muertes reportadas por complicaciones de la atención médica y quirúrgica en Brasil entre 2015 y 2018. **Método:** descriptivo y retrospectivo realizado entre junio y julio de 2020 con los registros de defunciones extraídos del Sistema de Información de Mortalidad en Salud. Los datos se agruparon en dos bienios 2015-2016 y 2017-2018 y se analizaron mediante estadísticas descriptivas y variaciones porcentuales. **Resultados:** se reportaron 6.587 muertes, especialmente em el bienio 2017-2018 (n=3.425;52%). Las muertes causadas por el uso de equipo médico se redujeron en Brasil, con una variación porcentual negativa del 15,4% entre los bienios. Hubo un aumento en las muertes por efectos adversos de medicamentos con una variación porcentual positiva de 12.2%. El número de muertes por accidentes durante la atención hospitalaria se mantuvo estacionario. **Conclusión:** se observaron cambios en los registros de muertes notificadas en Brasil, y es necesario ampliar las acciones preventivas dirigidas a reducir las muertes en todos los grupos de notificación.
Descriptores: Mortalidad Hospitalaria; Complicaciones Posoperatorias; Seguridad del Paciente; Prestación de Atención de Salud; Sistema Único de Salud

Introduction

With the advances in the area of health care, the discovery and development of new drugs, as well as the technological incorporation and minimally invasive procedures, contribute to improve the indicators of results; however, they potentiate the occurrence of incidents.[1] These events are mainly accentuated if associated with deficiencies of the multidisciplinary team in technical and non-technical skills, such as communication, teamwork, leadership and decision-making.[2] Thus, it is reaffirmed that health systems are complex and the assistance offered in hospital environments is not without risks, which are aggravated by structural limitations and existing failures in work processes.[3-4]

These failures if not properly managed culminate in complications related to hospital care and determine the emergence of acquired hospital conditions (CHA). CHA are defined as undesirable and unintentional events that occurred during the hospitalization period and were not present at the patient's admission.[5-6] These are

secondary complications, most caused by infections related to health care, medication use and other events resulting from side effects of primary treatments, such as surgical ones.[7]

Complications and their consequences have repercussions on the patient's hospitalization time and hospital costs, in addition to impacting on intra- and discharge rates in the world.[7] In the world, specifically in the surgical area, it is estimated that 4.2 million deaths are estimated in the first 30 days after the surgical procedure. Considering this estimate, in 2016, deaths occurred in the first 30 days after surgery were classified as the third cause of mortality, lower only for those caused by heart disease and stroke.[8]

In Brazil, from 2008 to 2016, the surgical mortality rate was 1.63%, ranging from 1.07% to 2.02% among the different macroregions.[9] In relation to hospital complications, infectious and pulmonary complications stood out in a prospective cohort study,[10] while in medical clinic units adverse drug reactions were prevalent and mostly related to antibiotic administration.[11]

Thus, showing the characteristics of deaths resulting from complications of medical-surgical care is a relevant theme to understand the profile of patients who are vulnerable to the occurrence of these diseases. Moreover, it allows stratification of actions of higher care risk, with a view to improving strategies of continuous improvement, focusing on patient safety. This is recognized as an important dimension of the quality of health care and aims to minimize harm to patients and deaths, contributing to the advancement of safe practices worldwide and nationally. Based on this premise, the following question was asked: What is the profile of cases of deaths reported due to complications of medical-surgical care in Brazil? The aim of this study was to describe the cases of deaths reported due to complications of medical and surgical care in Brazil between 2015 and 2018.

Method

Descriptive and retrospective research conducted from the records of deaths of complications of medical and surgical care. This information is contained in the Mortality Information System (MIS) and is made available by the platform of the Department of Informatics of the Unified Health System (DATASUS).[12-13] Data were collected by a nurse,

belonging to the research team and with experience in the use and handling of the respective platform, between June and July 2020.

The target population was composed of all cases of deaths reported due to complications of medical and surgical care in Brazil between 2015 and 2018, according to the categories of chapter XX of the International Classification of Diseases (ICD-10): Adverse effects of drugs, drugs and biological substances used for therapeutic purposes (Y40-Y59); Accidents that occurred in patients during the provision of medical and surgical care (Y60-Y69); Adverse incidents during diagnostic or therapeutic acts associated with the use of medical devices (devices) (Y70-Y82); and abnormal reaction in patient or late complication caused by surgical procedures and other medical procedures without mention of accident at the time of the procedure (Y83-Y84). This time frame was chosen because the last years are available for public consultation. There were no exclusion criteria.

The variables investigated were gender, age group and schooling (in years), marital status, color/race, Brazilian macroregions (North, Northeast, Southeast, South and Midwest) according to the place of death and category of medical and surgical complication. The extracted data were exported to the Microsoft Office Excel® 2016 spreadsheet and the deaths were grouped into two biennia (2015-2016 and 2017-2018) and distributed in age categories according to recommendations of the Brazilian Ministry of Health in 0-19, 20-39, 40-59, 60 and older years of age.[12]

Categorical variables were analyzed by descriptive statistics (absolute and relative frequencies). The percentage variation (PV) aims to analyze differences in death records and was calculated considering the first biennium (2015-2016) and the last biennium (2017-2018). The calculation was performed by the following formula:[14]

$$VPV = \frac{\text{\% of deaths by category of medical and surgical complication in 2017 to 2018 - \% of deaths in 2015 to 2016}}{\text{\% of deaths by category of medical and surgical complication scans in 2015 to 2016}} \times 100$$

The data used in this research are in the public domain, which eliminates the need for approval in the Ethics and Research Committee. It is emphasized that all ethical precepts recommended by Resolution 466/12 of the National Health Council were respected.

Results

In the period between 2015 and 2018, 6,587 deaths were reported in Brazil. There was a prevalence of records for the 2017-2018 biennium (52.0%). Demographic characteristics were similar among the reported cases, with predominance, for both biennia, of deaths among women and aged 60 or older (Table 1).

Table 1 - Distribution of demographic characteristics of reported cases of deaths due to complications of medical and surgical care in Brazil, biennia 2015-2016 and 2017-2018, Brazil, 2020.

Variable	Deaths										Total deaths	
	biennium 2015-2016				biennium 2017-2018							
Gender	Male		Female		Male		Female		Ignored			
	n	%	n	%	n	%	n	%	n	%	n	%
	1.393	21.1	1.768	26.8	1.558	23.7	1.867	28.3	1	0.02	6.587	100
Age group												
00 ├ 20	70	5.0	70	3.9	89	5.7	57	3.1	1	0.02	286	4.3
20 ├ 40	108	7.7	120	6.8	99	6.3	116	6.2			443	6.7
40 ├ 60	246	17.7	286	16.2	302	19.4	314	16.8			1.148	17.4
≥ 60	968	69.5	1.291	73.0	1.067	68.5	1.380	73.9			4.706	71.4
Ignored	1	0.1	1	0.1	1	0.1	-	-			3	0.1
Marital status												
Married	721	51.8	460	26.0	771	49.5	468	25.0	1	0.02	2.420	36.7
Widower	151	10.8	630	35.6	173	11.1	698	37.4			1.652	25.1
Single	277	19.9	371	21.0	301	19.3	401	21.5			1.350	20.5
Legally Separated	78	5.6	121	6.9	118	7.6	119	6.4			436	6.6
Other	33	2.4	23	1.3	50	3.2	45	2.4			151	2.3
Ignored	133	9.5	163	9.2	145	9.3	136	7.3			577	8.8
Color/Race												
White	728	52.3	1.075	60.8	873	56.0	1.091	58.4	1	0.02	3.767	57.2
Brown	495	35,5	493	28,0	505	32,4	570	30,5			2.063	31,3
Black	103	7,4	110	6,2	114	7,4	124	6,6			451	6,8
Ignored	60	4.3	82	4.6	55	3.5	65	3.5			262	4.0
Yellow	6	0.4	4	0.2	11	0.7	14	0.8			35	0.5
Indigenous	1	0.1	4	0.2	-	-	3	0.2			8	0.1
Schooling (in years)												
00-00	144	10.3	217	12.3	134	8.6	230	12.3	1	0.02	725	11.0
01-03	321	23.0	455	25.7	331	21.3	464	24.9			1.571	23.8

04-07	248	17.8	294	16.6	293	18.8	343	18.4			1.178	17.9
08-11	263	18.9	299	16.9	276	17.7	335	17.9			1.173	17.8
≥12	115	8.3	134	7.6	161	10.3	154	8.2			564	8.6
Ignored	302	21.7	369	20.9	363	23.3	341	18.3			1.375	20.9
Place of Occurrence												
Hospital	1.308	93.9	1.648	93.2	1.441	92.5	1.752	93.8	1	0.02	6.149	93.3
Domicile	37	2.7	59	3.3	56	3.6	45	2.4			197	3.0
Another health facility	37	2.7	46	2.6	46	2.9	60	3.2			189	2.9
Public Road	2	0.1	2	0.1	1	0.1	1	0.1			6	0.1
Other	7	0.5	12	0.7	13	0.8	9	0.5			41	0.6
Ignored	2	0.1	1	0.1	1	0.1	-	-			4	0.1

Source: SIM/DATASUS. 2020.

In both biennia, there was a difference regarding the main group of medical and surgical complications reported between the North, Northeast and Midwest regions of Brazil. The southeast region was prevalent in cases reported due to adverse effects of drugs, medications and biological substances used for therapeutic purposes, while for the southern region the deaths were related to adverse incidents during diagnostic or therapeutic acts associated with the use of medical devices (Table 2).

Table 2 - Distribution of causes of death due to complications of medical and surgical care according to the categories of chapter XX of the International Classification of Diseases (ICD-10) in Brazil according to region, gender and age group, biennia 2015-2016 and 2017-2018, Brazil, 2020.

	Deaths								Total of deaths
	biennium 2015-2016				biennium 2017-2018				
Variable	Y40-Y59*	Y60-Y69†	Y70-Y82‡	Y83-Y84§	Y40-Y59*	Y60-Y69†	Y70-Y82‡	Y83-Y84§	
	n %	n %	n %	n %	n %	n %	n %	n %	n %
Region									
Southeast	147 62.5	13 44.8	11 27.5	1.774 62.1	179 62.8	14 43.7	15 39.5	1.868 60.9	4.021 61.1
Northeast	33 14.0	8 27.6	10 25.0	771 27.0	28 9.8	5 15.6	8 21.0	825 26.9	1.688 25.6
South	38 16,2	4 13,8	11 27,5	185 6,5	50 17,6	10 31,3	13 34,2	241 7,8	552 8,4
Midwest	10	3	7	96	20	2	2	92	232

North	4,3 7 3,0	10,3 1 3.5	17,5 1 2.5	3,3 32 1.1	7,0 8 2.8	6,3 1 3.1	5,3 - -	3,0 44 1.4	3,5 94 1.4
Gender									
Female	141 60.0	11 37.9	18 45.0	1.598 55.9	145 50.9	23 71.9	20 52.6	1.679 54.7	3.635 55.2
Male	94 40.0	18 62.1	22 55.0	1.259 44.1	140 49.1	9 28.1	18 47.4	1.391 45.3	2.951 44.8
Ignored	-	-	-	1 0.03	-	-	-		1 0.02
Age group									
00 ├ 20	16 6.8	2 6.9	1 2.5	121 4.2	15 5.3	4 12.5	2 5.3	125 4.1	286 4.3
20 ├ 40	30 12.8	3 10.3	5 12.5	190 6.6	36 12.6	5 15.6	4 10.5	170 5.5	443 6.7
40 ├ 60	44 18.7	10 34.5	6 15.0	472 16.5	61 21.4	6 18.8	6 15.8	543 17.7	1.148 17.4
≥ 60	145 61.7	14 48.3	28 70.0	2.073 72.6	173 60.7	17 53.1	26 68.4	2.231 72.7	4.707 71.5
Ignored				2 0,1				1 0,03	3 0,1
Brazil	**235**	**29**	**40**	**2.858**	**285**	**32**	**38**	**3.070**	**6.587**

Source: SIM/DATASUS, 2020.

Note: *Y40-Y59 - Adverse effects of drugs, medicines and biological substances used for therapeutic purposes. †Y60-Y69 - Accidents in patients during the provision of medical and surgical care. ‡Y70-Y82 - Adverse incidents during diagnostic or therapeutic acts associated with the use of medical devices. §Y83-Y84 - Abnormal reaction in patient or late complication caused by surgical procedures and other medical procedures without mention of accident at the time of the procedure.

There is a prevalence of cases of deaths due to abnormal reaction in a patient or late complication caused by surgical procedures and other medical procedures without mention of an accident at the time of the procedure. Table 3 shows that the records of deaths from adverse incidents caused using medical equipment reduced in Brazil, with a negative percentage variation of 15.4% among the biennia. However, there was an increase in deaths from adverse effects of drugs and drugs (positive percentage variation of 12.2%), from 7.4% in 2015-2016 to 8.3% in 2017-2018, while the number of deaths caused by accidents during hospital care remained stationary.

Table 3 - Distribution of deaths according to the group and category of complications of medical and surgical care in Brazil, biennia 2015-2016 and 2017-2018, Brazil, 2020.

Group/Category	Biennial deaths				Total	
	2015-2016 (n=3.162)		2017-2018 (n=3.425)			
	n	%	n	%	n	%
Adverse effects of drugs, medicines and biological substances used for therapeutic purposes (PV*=12.2%)	**235**	**7.4**	**285**	**8.3**	**520**	**100**
Pharmacological substances that act primarily on blood constituents	49	20.8	69	24.2	118	22.7
Analgesic, Antipyretic and Anti-inflammatory substances	31	13.2	34	11.9	65	12.5
Substances of primarily systemic action	16	6.8	22	7.7	38	7.3
Psychotropic substances, not elsewhere classified	14	5.9	18	6.3	32	6.1
Systemic antibiotics	8	3.4	9	3.1	17	3.3
Anesthetics and therapeutic dressings	4	1.7	11	3.9	15	2.9
Substances that act primarily on the cardiovascular system	4	1.7	6	2.1	10	1.9
Hormones and their synthetic substitutes and antagonists, not elsewhere classified	2	0.9	7	2.4	9	1.7
Drugs that act primarily on the autonomic nervous system	4	1.7	4	1.4	8	1.5
Sedatives, hypnotics and tranquilizers [anxiolytics]	-	-	7	2.4	7	1.3
Anticonvulsant (antiepileptic) and antiparkinsonian drugs	4	1.7	2	0.7	6	1.2
Substances acting primarily on smooth and skeletal muscles and on the respiratory system	3	1.3	3	1.1	6	1.2
Bacterial vaccines	2	0.9	4	1.4	6	1.2
Substances acting primarily on the metabolism of water, mineral salts and uric acid	1	0.4	3	1.1	4	0.8
Substances acting primarily on the gastrointestinal tract	-	-	2	0.7	2	0.4
Topical substances that act primarily on the skin and mucous membranes and drugs of ophthalmologic, otorhinolaryngological and dental use	1	0.4	-	-	1	0.2
Other drugs and medicines and unspecified	87	37.0	80	28.1	167	32.1
Other vaccines and biological substances and those not specified	3	1.3	3	1.1	6	1.1
Other systemic anti-infectors and antiparasitiums	2	0.9	1	0.4	3	0.6
Accidents in patients during the provision of medical and surgical care (PV*=0%)	**29**	**0.9**	**32**	**0.9**	**61**	**100**
Accidental cutting, puncture, perforation or bleeding while providing medical or surgical care	13	44.8	22	68.7	35	57.4
Insufficient asepsis during the provision of surgical and medical care	4	13.8	1	3.1	5	8.2
Accident not specified during the provision of medical	3	10.3	2	6.3	5	8.2

and surgical care						
Foreign object accidentally left on the body while providing surgical and medical care	1	3.5	2	6.3	3	4.9
Contaminated medicinal products or biological substances	2	6.9	1	3.1	3	4.9
Dosage errors during the provision of medical and surgical care	1	3.5	-	-	1	1.6
Other accidents during the provision of medical and surgical care	5	17.2	4	12.5	9	14.8
Adverse incidents during diagnostic or therapeutic acts associated with the use of medical devices[†] (PV*= -15.4%)	**40**	**1.3**	**38**	**1.1**	**78**	**100**
Cardiovascular	11	27.5	12	31.7	23	29.5
General hospital or personal use	9	22.5	10	26.3	19	24.3
Orthopedics	8	20.0	4	10.5	12	15.4
Otorhinolaryngology	2	5.0	4	10.5	6	7.7
Gastroenterology and Urology	4	10.0	1	2.6	5	6.4
Anesthesiology	1	2.5	1	2.6	2	2.6
Physical Medicine (physiatosis)	-	-	1	2.6	1	1.3
Other specialties and the unspecified	5	12.5	5	13.2	10	12.8
Abnormal reaction in patient or late complication caused by surgical procedures and other medical procedures without mention of accident at the time of the procedure (PV*= -0.9%)	**2.858**	**90.4**	**3.070**	**89.6**	**5.928**	**100**
Surgical intervention and other surgical acts	2.601	91.0	2.769	90.2	5.370	90.6
Medical procedures	257	9.0	301	9.8	558	9.4

Source: SIM/DATASUS, 2020.

Note: *PV= percentage variation; [†]No reports of incidents caused by medical equipment were found for the specialties: neurology, obstetrics and gynecology, ophthalmology, radiology and general and plastic surgery.

Discussion

The data show that the reported cases of deaths due to complications of medical and surgical care, mostly occurred in the southeast region, in females, with low schooling and aged 60 or older. This result is like that found by an ecological study when analyzing 12,971 deaths that occurred between 2000 and 2010 in Brazil. This revealed a prevalence of deaths among women (52.3%; n=7,784), white color/race (64%; n=7,470), in the age group ≥ 60 (65.6%; n=8,508) and indicated that increased schooling is a protective factor for the occurrence of these diseases.[15] Another investigation, the objective of which was to describe the cases of incidents reported in the country in the

period 2014 to 2019, pointed out that of the 330,536 notifications, 44.1% were performed by hospital services concentrated in the southeastern Brazilian region.[16]

The literature reveals that the elderly population, due to the process of senility and associated comorbidities, such as systemic arterial hypertension, diabetes mellitus, osteoarticular diseases, cerebrovascular disease and cancer, require a longer hospital stay.[17] It is known that the reestablishment of patients over 60 undergoing surgery is slower when compared to young adults. This fact predisposes these individuals to a higher number of complications and deaths, especially if associated with the presence of comorbidities and delay in performing the surgery.[18]

Although most of these deaths may be associated with the greater vulnerability of this population, either by advanced age or comorbidities presented by these individuals, it is inferable that the quality of care offered in the triad structure, processes and results may have contributed to the fatal outcome of these cases.[19] The variations observed in relation to the number of deaths and their respective causes in the present study, which added to the demographic, epidemiological and regional disparities in financial, human and material resources for hospital care,[20] explain the similarities, or not, about the deaths reported among the five Brazilian macroregions.

Regarding the group/category of complications, abnormal reaction or late complications prevailed in both biennia, especially those caused by surgical procedures. In this place, it is evident an underestimation of the type of complication that contributed to the patient's death, which needs to improve the process of notification of these cases by the management team and health professionals.

In the first 30 days postoperatively, it is observed that pulmonary, infectious, surgical and cardiovascular complications contribute to the occurrence of deaths in patients undergoing non-elective surgeries.[10] Although it is recognized that emergency surgeries impact a higher risk of care and potentiate these cases in the postoperative period, it is necessary to develop interprofessional strategies to identify these risks early and promote immediate care aimed at minimizing deaths resulting from these diseases.

There was an increase in the number of reported deaths resulting from adverse effects of drugs, drugs and biological substances used for therapeutic purposes. It is

inferring that the frequent use of polypharmacy for the treatment of clinical diseases, human longevity and the fragile health of elderly patients make them more prone to these complications and deaths.[15] This fact may have contributed to increase the cases of deaths from this disease among the biennia, especially by considering the profile of reported cases, which were prevalent among individuals aged 60 or older.

Thus, the prescription, dispensing and administration of drugs, drugs and biological substances must follow a careful safety process, whose main purpose is to avoid harm to the patient, especially for pharmacological substances that act primarily on blood constituents. In this research, this was the main contributing category for episodes of medical and surgical complications, ranging from 20.8% to 24.2% of deaths recorded between the 2015-2016 and 2017-2018 years, respectively. It is believed that serious adverse reactions resulting from the use of blood/blood products in health services and the inappropriate use of high-surveillance drugs are one of the main causes of these deaths.

In five hospitals in Canada, 19.7% of adverse events were related to the administration of medications, intravenous fluids, biological substances and transfusion therapy.[21] Errors in the administration of potentially dangerous drugs may represent a higher risk of death or serious sequelae resulting from damage related to these medications,[22] which reinforces the need for investments in education/training for health professionals who work in clinical practice and/or in the process of training. Moreover, monitoring improvements in performance indicators by the management team becomes a growing and timely demand in this care place.

Of the events that occurred accidentally, most were caused by causes with potential for avoidability and related, mainly, to technical/procedural failures. In a Brazilian teaching hospital, technical failures contributed to about 40% of adverse events in surgical patients,[23] while in medical clinic wards in North American university hospitals, of the 356 adverse events analyzed, 44.7% were classified in the clinical process/procedure category,[16] predisposing patients to the risk of death. In Japan, in a review of accident reports that occurred in patients from 2010-2013, it pointed out that most deaths were caused by non-technical failures, for example, communication,

decision-making and work and team, and only 5.5% of deaths were attributed to technical failures.[24]

The divergences found in the literature regarding the outcome of patients undergoing clinical and surgical procedures can be explained by the different methodological designs applied, the clinical and demographic characteristics of patients, different professional training between regions and the team's behavior in adopting practices that ensure quality improvements in care. However, they highlight the problem at national and global level and encourage improvement of care and management actions aimed at preventing and correcting procedural errors, such as the proper use of the surgical checklist recommended by the World Health Organization and other tools institutionally adopted by health services.

About incidents due to the use of medical devices (devices), the data presented here indicate a reduction in cases reported among the biennia. The cardiovascular specialty was responsible for the greater number of cases recorded, which may be tied to the severity of the patient and the exposure of these individuals to the greater number of invasive procedures. In Brazil, in the period 2007-2016, 4,682 technical complaints and 671 adverse events involving the use of vascular catheters were reported, with catheter disruption during the procedure as the main reason for notification. Regarding the degree of damage of these events, four cases evolved to death due to the insertion of these devices.[25]

In this context, it becomes relevant to monitor the manufacture and deviations of the quality of these materials to ensure their safe use and without damage to the patient. In addition, the importance of the process of corrective maintenance of hospital equipment to promote patient safety is highlighted, because equipment failures, parts wear, abuse of use, operating errors, poor contact and other causes are frequent and directly impact the quality of procedures performed in the hospital area.[26]

This research has some limitations. One of them stems from the data being made up of a secondary database. The absence of information in the reported cases, such as the comorbidities of patients, the time of hospitalization and the non-discrimination of the reasons/causes of death in each group/category of notification are

added to the limitations. Although some reported incidents/accidents have the potential for avoidability, the lack of this information in the registered cases becomes another limiting factor, which makes it impossible to recognize a real situational diagnosis of this disease in the country.

The results found in this research contribute to health organizations being able to (re) visit their structural and procedural components, to improve health quality indicators. It is important to invest in interprofessional training and training/training in technical and non-technical skills for the maturation of the culture of institutional safety and consequent reduction of these deaths during hospital care.

Conclusion

This research showed that the cases of deaths reported due to complications of medical and surgical care in Brazil occurred due to failures and/or use of equipment, medications and acts in the provision of care, with emphasis on the surgical area. Among the biennia studied, there was an increase in cases reported for effects related to the use of drugs, drugs and biological substances for therapeutic use.

The greatest reduction occurred in the records of deaths associated with the use of medical devices. This result seems to indicate improvement in this group, however, the need for health services to strengthen measures and tools to promote quality of care is not ruled out, especially to groups/categories that presented an increase in the number of reported cases.

It is necessary to improve the notification process through a detailed system to identify risk factors according to the profile of each patient with the inclusion of other variables, for example, comorbidities. It is important to investigate the disparities found in the notifications between the macro-regions of Brazil with other social, cultural and economic indicators, which allow improving the identification, investigation and monitoring of the number of cases of complications and deaths resulting from medical-surgical care.

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Scientific Editor: Tania Solange Bosi de Souza Magnago
Associate Publisher: Etiane de Oliveira Freitas

How to quote this article

Moura VLL, Batista J, Amaro MLM, Borges BE, Osses ISE. Characterization of reported deaths resulting from complications of medical and surgical care. Nursing Journal. UFSM. 2022 [Access in: Year Month Day]; vol.12 e4: 1-16. DOI: https://doi.org/10.5902/2179769265710