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FACTORS RELATED TO THE OCCURRENCE OF ADVERSE EVENTS IN HOSPITALIZED ELDERLY PATIENTS

FATORES RELACIONADOS À OCORRÊNCIA DE EVENTOS ADVERSOS EM PACIENTES IDOSOS INTERNADOS

FACTORES RELACIONADOS A LA OCURRENCIA DE EVENTOS ADVERSOS EN PACIENTES ANCIANOS HOSPITALIZADOS

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Objective: analyze the factors related to the occurrence of adverse events registered in the histories of hospitalized elderly patients. Method: cross-sectional study, involving 260 hospitalizations at the surgical clinic of a teaching hospital in Goiânia, Goiás, Brazil. Descriptive analysis, univariate and multivariate association were performed. Results: associations were found between the presence of a companion, hospitalization for nine days or more, use of six or more medications per day, use of blood derivatives and use of catheter and tube. Hospitalization for more than nine days was an independent variable of risk for the occurrence of adverse events. Conclusion: the identification of the factors related to the occurrence of adverse events indicates the need to improve the quality of care, with a view to developing the competencies needed to deliver damage-free care to hospitalized elderly.

Descriptors: Geriatric nursing. Quality of health care. Patient safety.

Objetivo: analisar os fatores relacionados à ocorrência de eventos adversos registrados nos prontuários de idosos internados. Método: estudo transversal, conduzido com 260 internações ocorridas na clínica cirúrgica de um hospital de ensino de Goiânia, Goiás, Brasil. Foram realizadas análise descritiva, associação univariada e multivariada. Resultados: verificou-se associação entre presença de acompanhante, tempo de internação igual ou maior que nove dias, uso de seis ou mais medicamentos por dia, uso de hemoderivados e uso de cateter e sonda. O tempo de internação superior a nove dias foi constatado como variável independente de risco para a ocorrência de eventos adversos. Conclusão: a identificação dos fatores relacionados à ocorrência de eventos adversos indica a necessidade

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de melhorar a qualidade no atendimento, com vistas ao desenvolvimento de competências necessárias para prestar uma assistência livre de danos a idosos internados.

Descritores: Enfermagem geriátrica. Qualidade da assistência à saúde. Segurança do paciente.

Objetivo: analizar los factores relacionados a la ocurrencia de eventos adversos registrados en los archivos de ancianos internados. Método: estudio trasversal, desarrollado con 260 internaciones ocurridas en la clínica quirúrgica de un hospital de enseñanza de Goiânia, Goiás, Brasil. Fueron aplicados análisis descriptivo, asociación univariada y multivariada. Resultados: fue encontrada asociación entre presencia de acompañante, tiempo de hospitalización igual o superior a nueve días, uso de seis o más medicaciones por día, uso de derivados sanguíneos y uso de catéter y sonda. El tiempo de hospitalización superior a nueve días fue constatado como variable independiente de riesgo para la ocurrencia de eventos adversos. Conclusión: la identificación de los factores relacionados a la ocurrencia de eventos adversos indica la necesidad de mejorar la calidad en la atención, visando al desarrollo de competencias necesarias para prestar un cuidado libre de daños a ancianos hospitalizados.

Descriptores: Enfermería geriátrica. Calidad de la atención de salud. Seguridad del paciente.

Introduction

Around the world, care-related adverse events represent serious problems related to patient safety and are important indicators in the assessment of the quality of care. These events entail negative impacts for patients' health, influence the loss of confidence in the institution and result in economic repercussions[1].

According to the World Health Organization (WHO), adverse events are incidents that occur during health care and result in some kind of harm to the patient. Such damage may be physical, social or psychological, including illness, unintentional injury, suffering, temporary or permanent disability and death[2].

The proportion of adverse events in clinical and surgical hospitalization units is 56.9%[3]. Specifically in surgical hospitalization units, it is estimated that 18.7% of hospitalized patients are exposed to one or more adverse events[4].

Regarding the population affected by adverse events, studies in France and Canada showed that the elderly had a 34% and 64% incidence of adverse events when hospitalized, respectively, compared to populations of other age groups. Among the types of events, pressure lesions, falls and events related to the medication process were predominant[5-6].

It is known that these events increase the length of the patients' stay in health institutions. From this perspective, the analysis of avoidable adverse events occurring during one year in three public hospitals in Rio de Janeiro found 373 additional days of hospitalization, with healthcare-associated infections being responsible for 226 days and surgical and/or anesthetic complications for 79 days[3]. Consequently, most adverse events resulted in minor injuries. Nevertheless, severe damage and death were observed in more than 2.0% of the events[4].

The increased risk of adverse events in the elderly may be associated with vulnerabilities, fragilities, high prevalence of acute and chronic diseases and physiological and homeostatic changes typical of age. In addition, this group tends to resort more frequently to health services. In addition, hospitalizations and hospital readmissions may become routine and longer[7-8]. Added to these factors is the shortage of professionals prepared to take care of this population, which can increase the probability of potential damages and health problems of the hospitalized elderly[8].

In view of this scenario, and more specifically the scarcity of publications involving Brazilian elderly people in settings, it is important to know this reality to foster the reorganization of services with a view to the reduction of health-related damage.

This research aims to analyze the factors related to the occurrence of adverse events recorded in the patient histories of hospitalized elderly.

Method

This cross-sectional, retrospective study was carried out in the surgical clinic of a teaching hospital, which is a reference in high-complexity care in the city of Goiânia, Goiás, Brazil.

The population consisted of elderly people hospitalized from July to December 2013. This period was selected as a result of a reform in the physical structure of the unit, during the first half of the year, which made it impossible to occupy beds for patient hospitalization. Therefore, it was decided to start the investigation in the period when care had returned to normal. Data were obtained by analyzing the medical records of 260 elderly patients hospitalized in that period.

Inclusion criteria were patients hospitalized in the proposed period, aged ≥60 years, hospitalized for more than 24 hours. As an exclusion criterion, the hospitalization period shorter than 24 hours was adopted, as this period was considered insufficient for records related to care provided at the service.

Data collection was performed in April 2014. A structured instrument was used, containing questions on the general characteristics of the patient and the hospitalization (sex, age, hospitalization time, date of admission and discharge, comorbidities, presence of companion, type of admission - elective / emergency, surgery, medical specialty, hospitalization diagnosis, quantity of drugs used per day of hospitalization, use of tubes, drains, catheters and other devices, antibiotic prophylaxis and infusion of blood products), as well as a spreadsheet for the survey of possible adverse events the health workers documented in the medical records of the elderly (fall, pressure injury, exposure to thermal or chemical agents, allergic processes to medical-hospital products, medication errors; accidental withdrawal of tube, catheter or drain; obstruction of tube, drain, catheter or other devices; improper fixation of tube, drain or catheter; surgical dehiscence, acute pre- and postoperative pain, hospital infection, technical or material/equipment handling failures, failures during procedures/ techniques, blood products, sepsis, omission of care, incomplete vital signs, surgery suspension, evasion, failure to check prescribed care, and lack of medical and hospital supplies)[2].

The data were extracted from the records of the multiprofessional team in the different parts of the medical records.

The occurrence of the adverse event was the outcome variable. The identification of the damage was guided by the explicit record of the consequence of the adverse event for the elderly during hospitalization and its classification was based on the taxonomy for patient safety[2]. Exposure variables were related to the patient and the hospitalization.

In order to direct the analysis of the associated factors, the date on which the adverse event took place was recorded, as well as the time of the installation of the tube devices and other variables, ensuring that the exposure variable was present before the occurrence of the adverse event.

The types of adverse events were categorized according to the WHO definition[2]. After categorization, three experts in the area independently analyzed and validated the adverse events.

The data were processed in Statistical Package for Social Science, version 20.0 for Windows, analyzed descriptively, presenting relative and absolute frequencies for categorical variables and means for continuous variables. The normality of the continuous variables was analyzed by the Shapiro-wilk test.

To analyze the factors related to adverse events, a univariate analysis was performed using the Chi-Square test to compare the proportions and Odds Ratio (OR) as a measure of effect. For continuous variables, such as age, length of hospital stay and number of drugs prescribed, the mean was considered as the cutoff point for the dichotomous analysis. Regarding the type of admission, the comparison derives from the need to evaluate whether emergency hospitalizations have a higher risk of adverse events in relation to elective hospitalizations. The variables that obtained associations with $p < 0.10$, in the univariate analysis, were submitted

to multiple logistic regression, adjusted for sex and age, considering a 5% significance level.

This study is part of the matrix study "Analysis of Adverse Events in a Sentinel Network Hospital in the Central-West", approved by the hospital Ethics Committee (Protocol 064/2008).

Results

In total, 260 hospitalizations took place at the surgical clinic between July and December 2013, corresponding to 19.9% of all hospitalizations during the period.

Table 1 presents the elderly patients' characteristics, the clinical aspects of the hospitalization and the association between the exposure variables and the adverse events.

Table 1 – Univariate association between exposure variables and occurrence of adverse events during hospitalizations of elderly people at a surgical clinic of a teaching hospital. Goiânia, Goiás, Brazil – 2013 (N=260)

(continued)

Variables	Total sample n	Prevalence of Adverse Events		Odds Ratio	95% Confidence Interval	p
		n	%			
Age Range						
Up to 70 years	93	53	56.9	0.89	0.53 - 1.48	0.650
71 years or more	167	100	59.8			
Sex						
Male	131	83	63.3	0.68	0.42 - 1.13	0.136
Female	129	70	54.2			
Comorbidities						
Yes	178	103	57.8	0.81	0.41 - 1.41	0.451
No	73	46	63.0			
Type of Admission						
Urgency	150	95	63.3	1.55	0.94 - 2.55	0.086
Elective	110	58	52.7			
Surgical Intervention						
Yes	209	122	58.3	0.90	0.48 - 1.69	0.754
No	51	31	60.7			
Presence of Companion						
Yes	142	93	65.4	1.83	1.11 - 3.02	**0.042**
No	49	27	55.1			
Length of Hospitalization						
Nine days or more	67	65	97.0	38.78	9.23-162.90	**0.000**
One to eight days	193	88	45.5			
Number of Medications						
6 or more prescriptions/ day	101	72	71.2	2.39	1.40 - 4.07	**0.001**
1 to 5 prescriptions/day	159	81	50.9			
Blood derivative infusion						
Yes	44	35	79.5	3.23	1.48 - 7.04	**0.002**
No	216	118	54.6			
Catheter Use						
Yes	227	140	61.6	2.47	1.17 - 5.23	**0.015**
No	33	13	39.3			

Table 1 – Univariate association between exposure variables and occurrence of adverse events during hospitalizations of elderly people at a surgical clinic of a teaching hospital. Goiânia, Goiás, Brazil – 2013 (N=260) (conclusion)

Variables	Total sample n	Prevalence of Adverse Events		Odds Ratio	95% Confidence Interval	p
		n	%			
Tube Use						
Yes	92	64	69.5	2.03	1.18 - 3.47	**0.009**
No	168	89	52.9			
Drain Use						
Yes	55	35	63.6	1.29	0.70 - 2.39	0.416
No	205	118	57.5			

Source: Created by the authors.

In the univariate analysis, the factors related to the occurrence of adverse events were: presence of companion (OR 1.83, 95%CI 1.11-3.02); length of hospitalization nine days or more (OR 38.78, 95%CI 9.23-162.90); prescription of six or more medications per day (OR 2.39, 95%CI 1.40-4.07); blood derivative infusion (OR 3.23, 95%CI 1.48-7.04); catheter use (OR 2.47, 95%CI 1.17-5.23) and probe use (OR 2.03, 95%CI 1.18-3.47).

Table 2 – Multiple logistic regression analysis of factors related to the occurrence of adverse events during the hospitalizations of elderly patients at a surgical clinic of a teaching hospital. Goiânia, Goiás, Brazil – 2013 (N=260)

Variables	Odds Ratio (95% Confidence Interval)			
	Not adjusted	p	Adjusted	p
Age > 70 years	0.89 (0.53 - 1.48)	0.650	0.66 (0.35 - 1.23)	0.189
Male sex	0.68 (0.42 - 1.13)	0.136	0.65 (0.37 - 1.17)	0.153
Presence of companions	1.83 (1.11 - 3.02)	0.042	0.85 (0.47 - 1.56)	0.603
Hospitalization > 9 days	38.78 (9.23 - 162.9)	0.000	34.16 (7.72 - 151.12)	**0.000**
Blood derivative infusion	3.23 (1.48 - 7.04)	0.002	1.03 (0.38 - 2.75)	0.959
Tube use	2.03 (1.18 - 3.47)	0.009	1.05 (0.54 - 2.05)	0.891
Catheter use	2.47 (1.17- 5.23)	0.015	1.24 (0.55 - 2.78)	0.600
≥ 5 prescribed medications	2.39 (1.40 - 4.07)	0.001	1.26 (0.67 - 2.37)	0.472

Source: Created by the authors.

In Table 2, the multiple logistic regression analysis indicated one variable, length of hospitalization, with independent association, with a 34 times higher probability of adverse events among elderly people hospitalized for nine days or longer.

Discussion

Elderly patients are at high risk for adverse events during hospitalization[5-6]. The exposure of the elderly to adverse events can be explained by their health condition at the time of hospitalization, by non-promising responses to treatment, by prolonged hospitalization time, by the qualification of professionals to perform procedures in individuals with fragile health, as well as by the inherent characteristics of the aging process, which result in difficulties in effective decision making during care practice[7,9].

In the context of health care practice, a study pointed out that a single patient may suffer multiple adverse events during care delivery[4]. Therefore, care should be planned according to the individuality of each patient and knowing about the clinical and epidemiological characteristics that predispose to the occurrence

of adverse events, insofar as these permit the minimization and/or elimination of such events[6].

Length of hospitalization is commonly seen as a risk factor and influences the occurrence of adverse events[9]. In health institutions, the consequences of these events during the stay of the elderly patient are diverse. One example is the extension of the length of stay, temporary or permanent disabilities, increased costs for institutions and society. The most damaging result is the death of the patients[1,6].

In this study, hospitalization time of nine days or longer presented an independent association, with a 34-fold higher probability of adverse events when compared to hospitalizations shorter than nine days.

The factors that may contribute to the postponement of hospital discharge are influenced by age, gender, clinical conditions, diagnosis and care provided, delays or cancellations in surgical procedures, clinical destabilization, waiting time to stabilize the clinical condition, need for care at other levels of complexity, patients in antibiotics therapy, financial, family and social difficulties[9,10].

The literature indicates that patients with an inpatient period of more than 15 days present a greater nutritional risk[11], a situation that can be aggravated by the condition of being elderly. In addition, the lack of resources by the organization and the lack of staffing are other factors that can directly interfere in the length of stay, being associated with the quality of patient care. Thus, significantly longer hospitalization periods may indicate administrative inefficiency and/or poor quality of health care[9,10].

Although they did not maintain an independent association after multiple regression analysis, the presence of a companion, infusion of blood products, use of tube devices and prescription of six or more medications per day had a statistically significant association in the univariate analysis.

The presence of a companion can favor the active participation in elderly care, and can minimize and/or eliminate unnecessary damages during hospitalization[12]. The presence of a companion was a factor associated with the presence of adverse events though. As this association was not supported by the multiple analysis, a possible hypothesis for the occurrence of this association in the univariate analysis is the possibility of the nurse delegating some care without proper instruction. It should be emphasized that article 92 of the Nursing Code of Ethics prohibits delegating attributions of nursing professionals, established by law, to the patient's companions and/or responsible caregivers[13].

Transfusion therapy is a widely used health intervention that, despite saving lives or improving a serious condition, poses risks inherent in its practice, with the potential to cause fatal clinical outcomes[14]. In the elderly, this therapeutic option is essential for the treatment of countless diseases, such as acute and chronic anemia, neoplasia, spinal aplasia and emergency care[15]. In the United States, voluntary registration of hemovigilance-related adverse events between 2010 and 2012 found that allergic reactions occurred in 46.8% of the cases. Among the reactions, 7.2% were considered severe or life-threatening and 0.1% were fatal[16]. Although the norms for transfusion therapy are recognized, the main causes of harmful events are still related to human factors[14].

Regarding the use of tube devices, regardless of the purpose, improper use of the technique, time of use and professional skill, risks to patients can be severe. Therefore, in order to ensure the safe use of these devices and to avoid unnecessary harm to patients during the care provided, there is a need to adopt well-established work processes adapted to each patient's characteristics[17].

Keeping in mind that hospitalizations can entail negative consequences for the elderly patients' health, surgical patients are exposed to the use of invasive equipment such as catheters and probes, which extends the length of stay in the hospital bed and the probability of adverse events[18].

Investigating comorbidities as a factor of exposure to the adverse events should be considered as, besides enhancing the elderly's fraily, this condition is frequently associated with diverse medication indications. The estimated prevalence of inappropriate medication use for

elderly during hospitalization ranges between 58.4% and 75.0%, depending on the evaluation criterion used[19].

In this perspective, it is important to evaluate the drug therapy during the hospitalization, especially when multiple therapies are prescribed. Polypharmacy contributes to the increase of adverse drug reactions, drug interactions, undesirable side effects and reduction of treatment compliance[19]. These events can be attributed to the elderly's vulnerability to drug-related adverse events[5], which is due to the greater occurrence of usually chronic and more severe health problems.

The absence and/or insufficiency of information on factors associated with adverse events is determinant and contributes significantly to the occurrence of new events[20]. In this sense, the need is emphasized to evaluate the elderly from admission to discharge, as well as to implement educational strategies for reporting, in order to promote professional training.

In Brazil, the National Patient Safety Program (PNSP), established in 2013 by the Ministry of Health, through Decree 529/2013 and Resolution of the Collegiate Board of Directors (RDC) 36/2013, represents an important management initiative for the qualification of health care in all Brazilian health facilities[21].

With regard to health management, the greatest challenge is to train and/or professionalize professionals in management positions to increase the use of electronic communication and information technologies, as well as to reduce the instability and turnover of public managers due to party-political implications[22]. The overcoming of management difficulties is directly related to the efficiency and effectiveness of the services the health system offered.

In this perspective, knowing the factors related to adverse events in a population that lacks safe and quality care can guide the elaboration of educational actions for the reporting and prevention of adverse events, more effective management and evaluation policies, focusing on specialized care to ensure safe care for hospitalized elderly patients.

As limitations for this study, the possibility of underreporting of adverse events in the medical records of the elderly is highlighted, which may indicate superior exposure to what was portrayed in this study. This analysis highlights the importance of organizational support in the development of attitudinal competencies in health professionals, in order to understand that adverse events are notified, reported, mitigated and then explored in all forms of prevention.

The relevance of this study is to diagnose situations of risk for the occurrence of healthcare-associated adverse events in the elderly, which contributes to the expansion of knowledge in health and nursing. The identification of the factors related to the occurrence of adverse events in the elderly allows managers, health professionals and researchers to adopt actions focused on quality-based assistance, safe care and evidence-based practice.

Conclusion

The study reached the proposed goal and showed that the association of the variables presence of accompanying person, prescription of six or more medications per day, infusion of blood products, use of catheter and use of tube was not maintained in the multiple analysis. The length of hospital stay of nine days or longer was an independent association factor for the occurrence of adverse events, increasing the risk of exposure by 34 times when compared to the elderly patients hospitalized for less than nine days. Its dissemination broadens the knowledge of professionals and the community in general in the understanding of factors that contribute to adverse events that can cause psychological and behavioral changes in hospitalized elderly.

It is concluded that the identification of the factors related to the occurrence of adverse events indicates the need to improve the quality of care, with a view to developing the necessary skills to provide damage-free care to hospitalized elderly people.

We hope that the results will support decision making to prioritize safe care and quality of care,

aiming for the development of fundamental skills to provide damage-free care to hospitalized elderly people. Studies focused on this theme are necessary to point out preventive and corrective measures that transform this reality and guarantee the incorporation of scientific evidence in the practice of health professionals, considering the specificities of this age group.

Collaborations:

1. conception, design, analysis and interpretation of data: Cristiane Chagas Teixeira, Ana Lúcia Queiroz Bezerra, Thatianny Tanferri de Brito Paranaguá and Valéria Pagotto.

2. writing of the article and relevant critical review of the intellectual content: Cristiane Chagas Teixeira, Ana Lúcia Queiroz Bezerra, Thatianny Tanferri de Brito Paranaguá and Valéria Pagotto.

3. final approval of the version to be published: Cristiane Chagas Teixeira and Ana Lúcia Queiroz Bezerra.

References

1. Hoogervorst-Schilp J, Langelaan M, Spreeuwenberg P, de Bruijne MC, Wagner C. Excess length of stay and economic consequences of adverse events in Dutch hospital patients. BMC Health Serv Res. 2015;15:531.

2. World Alliance for Patient Safety. Taxonomy. The conceptual framework for the international classification for patient safety: final technical report. Geneva; 2009.

3. Mendes W, Pavão ALB, Martins M, Moura MLO, Travassos C. Características de eventos adversos evitáveis em hospitais do Rio de Janeiro. Rev Assoc Med Bras [Internet]. 2013 [cited 2016 Dec 12];59(5):421-8. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-42302013000500006

4. Paranaguá TTB, Bezerra ALQ, Silva AEBC, Azevedo Filho FM. Prevalence of no harm incidents and adverse events in a surgical clinic. Acta Paul Enferm. 2013;26(3):256-62.

5. Ackroyd-Stolarz S, Bowles SK, Giffin L. Validating administrative data for the detection of adverse events in older hospitalized patients. Drug Healthc Patient Saf. 2014;6:101-8.

6. Dupouy J, Moulis G, Tubery M, Ecoiffier M, Sommet A, Poutrain JC, et al. Which adverse events are related to health care during hospitalization in elderly inpatients? Int J Med Sci. 2013;10(9):1224-30.

7. Buurman BM, Frenkel WJ, Abu-Hanna A, Parlevliet JL, de Rooij SE. Acute and chronic diseases as part of multimorbidity in acutely hospitalized older patients. Eur J Intern Med. 2016;27:68-75.

8. Carretta MB, Bettinelli LA, Erdmann AL, Higashi GDC, Santos JLG. Compreendendo o significado do ser idoso vivenciando sua autonomia na hospitalização. Rev Rene. 2013;14(2):331-40.

9. Ceballos-Acevedo T, Velásquez-Restrepo PA, Jaén-Posada JS. Duración de la estancia hospitalaria. Metodologías para su intervención. Rev Gerenc Polít Salud. 2014;13(27):274-95.

10. Silva AMN, Souza EFD, Barbosa TLA, Silva CSO, Gomes LMX. Fatores que contribuem para o tempo de internação prolongada no ambiente hospitalar. J Res: Fundam care. 2014;6(4):1590-600.

11. Duarte A, Marques AR, Sallet LHB, Colpo E. Nutritional risk in hospitalized patients during hospital stay. Nutr Clín Diet Hosp. 2016;36(3):146-52.

12. Wolff JL, Boyd CM, Gitlin LN, Bruce ML, Roter DL. Going it together: persistence of older adults' accompaniment to physician visits by a family companion. J Am Geriatr Soc. 2012;60(1):106-12.

13. Conselho Federal de Enfermagem. Resolução n. 564/2017. Aprova o novo Código de Ética dos Profissionais de Enfermagem [Internet]. 2017 [cited 2018 Jul 23]. Available from: http://www.cofen.gov.br/resolucao-cofen-no-5642017_59145.html

14. Bolton-Maggs PHB, Cohen H. Serious Hazards of Transfusion (SHOT) haemovigilance and progress is improving transfusion safety. Br J Haematol. 2013;163(3):303-14.

15. Pornkuna R, Wongkhantee S, Jinathongthai S, Shimogawa S, Takemoto S. Effect of Blood Transfusion on Supportive Therapy of Elderly Patients at Kumamoto, Japan as Compared with Khon Kaen, Thailand. J Hematol Thrombo Dis. 2014;2(3):152.

16. Harvey AR, Basavaraju SV, Chung KW, Kuehnert MJ. Transfusion-related adverse reactions reported to the National Healthcare Safety Network Hemovigilance Module, United States, 2010 to 2012. Transfusion. 2015;55(4):709-18.

17. Silva AEBC, Laselva CR, Carrara D, Perini E, Pinto GRS, Sousa MRG, et al. Erros de conexão: práticas seguras e riscos na administração de soluções por sondas enterais e cateteres vasculares. Bol ISMP Brasil [Internet]. 2013 [cited 2016 Nov 30];2(3):1-4. Available from: http://www.ismp-brasil.org/site/wp-content/uploads/2015/07/V2N3.pdf

18. Vendites S, Almada-Filho CM, Minossi JG. Aspectos gerais da avaliação pré-operatória do paciente idoso cirúrgico. Arq Bras Cir Dig. 2010;23(3):173-82.

19. Tosato M, Landi F, Martone AM, Cherubini A, Corsonello A, Volpato S, et al. Potentially inappropriate drug use among hospitalised older adults: results from the CRIME study. Age Ageing. 2014;43(6):767-73.

20. Loke YK. Lack of clarity in reports of adverse events: is there any harm? Pain. 2013;154(2):183-4.

21. Brasil. Ministério da Saúde. Agência Nacional de Vigilância Sanitária. Portaria n. 529, de 1 de abril de 2013. Institui o Programa Nacional de Segurança do Paciente. Brasília; 2013.

22. Lorenzetti J, Lanzoni GMM, Assuiti LFC, Pires DEP, Ramos FRS. Gestão em saúde no Brasil: diálogo com gestores públicos e privados. Texto Contexto Enferm. 2014;23(2):417-25.

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