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ORIGINAL ARTICLE / *ARTIGO ORIGINAL*

Trends in hospitalization and mortality for ambulatory care sensitive conditions among older adults

Tendência das internações e da mortalidade de idosos por condições sensíveis à atenção primária

Mayara Marta Rodrigues[I], Angela Maria Alvarez[I], Keila Cristina Rauch[II]

ABSTRACT: ***Objective:*** To analyze the trends in hospitalization and mortality rates for ambulatory care sensitive conditions (ACSC) among older adults in the state of Santa Catarina, Brazil, from 2008 to 2015. ***Method:*** Ecological time-series study based on data from the Hospital Information System (*Sistema de Informações Hospitalares* – SIH) of the public health system (*Sistema Único de Saúde* – SUS), using hospital admission authorization forms as data source, from 2008 to 2015, in Santa Catarina. Data were analyzed by gender and age, which was stratified into two age groups: 60 to 79 years and 80 years or older. We standardized age rates using the direct method and statistical analysis using segmented linear regression (joinpoint regression). ***Results:*** Sensitive conditions led to 41% of total hospitalizations of older adults in 2008 and 32% in 2015. The annual rate variation decreased [-4.6^ 95%CI (-5.7; -3.6)]. The most prevalent causes were: heart failure, chronic obstructive pulmonary disease, and cerebrovascular diseases. Hospitalization mortality rates dropped, regardless of gender and in the age group up to 80 years, representing an annual variation of -2.4%, with -2.1% for males and -2.7% for females. ***Conclusion:*** Analyzing the ACSC indicator, which evaluates the quality and effectiveness of primary care, the results of this research revealed a reduction in hospitalization rates among older adults, regardless of gender and age groups established in this study.

Keywords: Primary health care. Aged. Hospitalization. Epidemiology.

[I]Universidade Federal de Santa Catarina – Florianópolis (SC), Brazil.
[II]Universidade do Sul de Santa Catarina – Florianópolis (SC), Brazil.
Corresponding author: Mayara Marta Rodrigues. Avenida das Paineiras, 721, Daniela, CEP: 88053-060, Florianópolis, SC, Brazil. E-mail: mayara153@hotmail.com
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RESUMO: ***Objetivo:*** Analisar a tendência das taxas de internação e de mortalidade de idosos por condições sensíveis à atenção primária (CSAP) no estado de Santa Catarina, Brasil, no período de 2008 a 2015. ***Método:*** Estudo ecológico de série temporal, com dados do Sistema de Informações Hospitalares (SIH) do Sistema Único de Saúde (SUS), utilizando as autorizações de internações hospitalares como fonte de dados, no período de 2008 a 2015, em Santa Catarina. Os dados foram analisados por sexo e idade, estratificada em duas faixas etárias: 60 a 79 anos e 80 anos ou mais. Foram realizadas a padronização das taxas por idade através do método direto e a análise estatística por meio de regressão linear segmentada (*joinpoint regression*). ***Resultados:*** As internações por condições sensíveis representaram 41% do total de internações de idosos em 2008 e 32% em 2015. A variação anual da taxa comportou-se de maneira decrescente [-4,6^ IC (-5,7; -3,6)]. As causas mais prevalentes foram: insuficiência cardíaca, doença pulmonar obstrutiva crônica e doenças cerebrovasculares. As taxas de mortalidade das internações apresentaram redução, independentemente do sexo e na faixa etária até 80 anos, representando variação anual de menos 2,4%, 2,1% para os idosos e 2,7% para as idosas. ***Conclusão:*** Por meio da análise do indicador CSAP, que avalia a qualidade da assistência e a efetividade dos cuidados prestados na atenção primária, os resultados desta pesquisa evidenciaram queda nas taxas de internação de idosos, independentemente do sexo e das faixas etárias estabelecidas no estudo.

Palavras-chave: Atenção primária à saúde. Idoso. Hospitalização. Epidemiologia.

INTRODUCTION

The current perspective on aging population experienced in Brazil and the world leads to challenges to health care models. Thus, it is essential to incorporate measures aimed at the needs of the older adult population, in order to provide dignified aging for all[1].

Estimations predict that Brazil will have close to 13 million older adults (12.4%) in 2020. Thinking in the long term, in 2060, over one-third of the population will consist of people aged 60 years or older (33.7%)[2], indicating an overload on the health system, given that older adults use this service at a rate significantly higher than other age groups.

Issues concerning the performance of and access to the health system are related to high hospitalization rates, which have adverse effects on the functional capacity of older adults and burden the health system[3,4]. Studies reveal a close relationship between hospitalized older adults and conditions of vulnerability, limitation of autonomy, and subsequent cognitive decline[5-7]. A way to avoid these disruptions in the life of older adults would be resorting to hospitalization only after exhausting the resources of other health care levels. As a planning tool, the Ministry of Health created the Brazilian List of Hospitalizations for Ambulatory Care Sensitive Conditions in 2008.

ACSCs are health demands that should be met by primary care, the preferred mean of access to and the basis of the Brazilian health system, whose outcome, in case of lack of effective care, can lead to hospitalization[8]. Consequently, care should be decisive and comprehensive, with referral to the tertiary level only in specific cases not covered by its competence[9].

Exploring elements associated with hospitalizations considered preventable has become a relevant topic to health care, as it assists in the elaboration of public policies that strengthen both primary and tertiary care[10]. Regarding the care of older adults, delaying their hospitalization means preserving their quality of life, autonomy, and independence. Therefore, the objective of this study was to analyze the trends in hospitalization and mortality rates for ACSCs among older adults in the state of Santa Catarina, from 2008 to 2015.

METHOD

This is an ecological time-series study that evaluated disease/condition indicators in a given geographically defined population at distinct moments in time. The study analyzed hospitalizations for ACSCs among older adults in the state of Santa Catarina (SC), from 2008 to 2015. We considered older adults individuals whose age was greater than or equal to 60 years, as established by Article 2 of Law No. 8,842 of 1994, which provides for the National Policy for Older Persons and creates the National Council for Older Persons[11].

To define the ACSCs, we used the official list published by the Ministry of Health in the Directive No. 221 of April 17, 2008[12], which consisted of 19 groups of causes, with 74 diagnoses categorized according to the 10th Revision of the International Classification of Diseases (ICD10). The study did not include group 19 of hospitalizations for ACSCs, that is, diseases related to prenatal care and childbirth (O23: urinary tract infection during pregnancy; A50: congenital syphilis; P35: congenital rubella syndrome), as they represent an outcome incompatible with the age group established.

Information about hospitalizations were obtained from the hospital admission authorization forms (*autorizações de internação hospitalar* – AIHs) of the Hospital Information System (*Sistema de Informações Hospitalares* – SIH), made available by the Technology Department of the public health system (*Departamento de Informática do Sistema Único de Saúde* – Datasus), tabulated with the aid of the software TabWin and exported to Microsoft Excel for data consolidation. Population data were collected from the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística* – IBGE). We determined the crude hospitalization rate using the ratio between the number of hospitalizations for ambulatory care sensitive conditions (HACSCs) among older adults and the reference population in the period multiplied by 10 thousand. To calculate the crude mortality rate, we used the ratio between the number of HACSCs resulting in death among older adults and the reference population in the period multiplied by 10 thousand. Data were also analyzed by gender and age, which was stratified into two age groups: 60 to 79 years and 80 years or older, using the following formula: ratio between HACSCs/HACSCs resulting in death by age group and gender and the older adult population in the period by age group and gender multiplied by 10 thousand.

Next, we standardized hospitalization and mortality rates for ACSCs among older adults by age using the direct method, adopting the standard world population as reference[13].

The rate adjusted for age was: Σ (specific rate by age) × (standard world population in the age group)/Σ standard world population.

To soften the historical series, due to point oscillation, we calculated the moving average centered on three terms. In this process, the annual coefficient analyzed corresponds to the arithmetic mean of the coefficients of the previous, current, and following year. However, the historical series covers the years 2009 to 2014, despite using information from 2008 to 2015 for the calculation.

The software Joinpoint, version 4.3.1, calculated the variation in hospitalization rates for ACSCs among older adults adjusted for age, from 2008 to 2015. The use of the joinpoint method allows a detailed description of trends, identifying the changes over the years. The software performs a segmented linear regression (joinpoint regression) to estimate the annual percentage variation and identify points with changes in trend.

Based on the estimated slope for each line segment (regression coefficient), we calculated the annual percentage variation and its statistical significance, determined by the least squares method for a generalized linear model, assuming that the rates follow a Poisson distribution and that the rate variation is not constant over the period. For each line segment, with an estimated slope, we calculated the limits of the confidence interval of 95% (95%CI).

RESULTS

The results of this study demonstrate that the number of older adults in Santa Catarina rose from 6,052,587 (55.1% of women and 44.9% of men) in 2008 to 6,819,190 (54.6% of women and 45.3% of men) in 2015.

In the study period (2008–2015), 842,682 older adults were hospitalized, 303,757 of them for ACSCs, that is, 41% of the total admissions in 2008 and 32% in 2015. Women represented 51.4% of hospitalizations and men, 48.6%. Hospitalization rates ranged from 638 in 2008 to 486 in 2015 per 10 thousand inhabitants and were higher for men and in the age group of 80 years or older, as shown in Table 1.

Hospitalization rates of older adults aged 80 years or older dropped between 2008 and 2012; however, after 2012, they increased slightly. In the age group of 60 to 79 years, hospitalization rates decreased more significantly until 2012, having a smaller variation after this year, as illustrated in Figure 1.

Table 2 shows the annual rate variation in hospitalization and indicates a reduction in admissions for ACSCs [-4.6^ 95%CI (-5.7; -3.6)]. HACSCs dropped 4.6%, with 95%CI. The age group of 60 to 79 years represented 87% of the older adult population in the state of Santa Catarina and had a sharper decrease than the group aged 80 years or older. Hospitalizations among women and men had similar variation, but women still had a greater one.

The most significant health issues that resulted in HACSCs among older adults were: heart failure, chronic obstructive pulmonary diseases (COPDs), and cerebrovascular diseases.

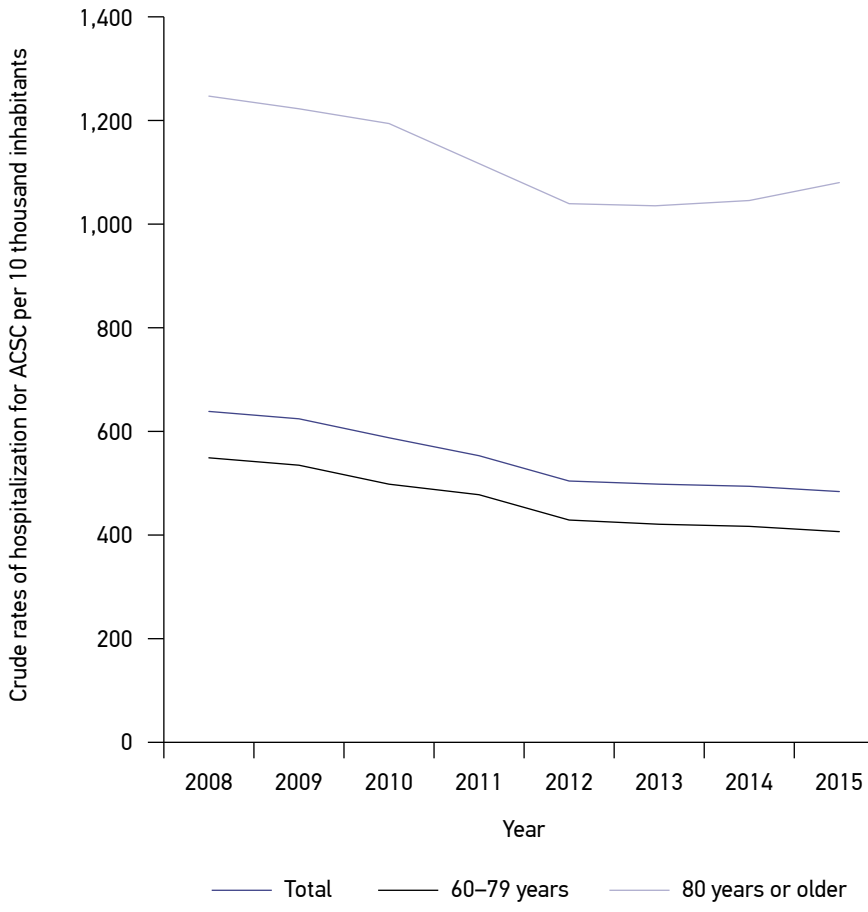
Conditions that showed reduction between 2008 and 2015 were infectious gastroenteritis and complications, asthma, COPD, hypertension, heart failure, and diabetes mellitus. On the other hand, bacterial pneumonia, angina, cerebrovascular diseases, and kidney and urinary tract infections increased over the years, as shown in Table 3. The group Other consists of other groups of ACSCs contemplated in this study (vaccine-preventable diseases and preventable conditions, iron deficiency anemia, nutritional deficiencies, skin and subcutaneous tissue infection, female pelvic inflammatory disease, and bleeding ulcer).

Together, cardiovascular diseases (heart failure, arterial hypertension – AHT –, angina, and cerebrovascular diseases) are responsible for 49.5% of hospitalizations for ACSCs among older adults, followed by respiratory diseases (bacterial pneumonia, asthma, and COPD), which represent 26.8%.

Table 1. Crude and adjusted rates and raw numbers of hospitalization among older adults, according to gender, age group, and ambulatory care sensitive conditions in Santa Catarina, 2008–2015. Florianópolis, 2016.

	2008	2009	2010	2011	2012	2013	2014	2015
HACSC								
C rt	638	623	589	558	507	500	497	486
Adj rt	70	68	64	61	55	55	54	53
R No.	37,042	38,003	37,799	37,714	36,087	37,460	39,252	40,400
Fem								
C rt	601	588	548	522	472	468	463	455
Adj rt	66	65	60	58	52	52	51	50
R No.	19,284	19,801	19,376	19,414	18,444	19,234	20,023	20,681
Male								
C rt	681	664	638	601	550	538	538	523
Adj rt	75	73	70	66	60	59	59	57
R No.	17,758	18,202	18,423	18,300	17,643	18,226	19,229	19,719
60–79								
C rt	554	539	503	478	431	423	418	409
Adj rt	61	59	55	53	47	46	46	45
R No.	28,282	28,852	28,293	28,278	26,808	27,687	28,816	29,630
80 or +								
C rt	1,248	1,225	1,199	1,123	1,043	1,039	1,048	1,082
Adj rt	137	135	132	124	115	114	115	119
R No.	8,760	9,151	9,506	9,436	9,279	9,773	10,436	10,770

HACSC: hospitalizations for ambulatory care sensitive conditions; C rt: crude rate; Adj rt: adjusted rate; R No.: raw number.



ACSC: ambulatory care sensitive conditions.

Figure 1. Rates of hospitalization for ambulatory care sensitive conditions in Santa Catarina, 2008–2015. Florianópolis, 2016.

Table 2. Annual rate variation in hospitalization of older adults, according to age group, general numbers, and ambulatory care sensitive conditions in Santa Catarina, 2008–2015. Florianópolis, 2016.

Variables	Annual rate variation 2008–2015	(95%CI)
HACSC	-4,6^	(-5.7; -3.6)
HACSC – females	-4,7^	(-5.9; -3.6)
HACSC – males	-4,5^	(-5.5; -3.6)
HACSC – 60 to 79 years	-5,1^	(-6.2; -4.0)
HACSC – 80 years or older	-3,6^	(-4.9; -2.4)

HACSC: hospitalizations for ambulatory care sensitive conditions; 95%CI: confidence interval of 95%.

Hospitalization mortality rates dropped, regardless of gender and in the age group up to 80 years, representing an annual variation of -2.4%, with -2.1% for males and -2.7% for females. The age group analysis showed distinct behaviors for each one of them. While the annual variation decreased 3.9% in the population aged 60 to 79 years, it increased 5.9% for individuals aged 80 years or older, as shown in Table 4.

Table 3. Proportion of the main causes of hospitalization for ambulatory care sensitive conditions among older adults. Santa Catarina, 2008 and 2015. Florianópolis, 2016.

Groups of causes of ACSC	Proportion of hospitalizations of older adults for ACSC (%)	
	2008	2015
Infectious gastroenteritis and complications	4,743	4,562
Bacterial pneumonia	4,260	9,210
Asthma	2,716	1,072
COPDs	22,121	15,203
Hypertension	3,056	2,490
Angina pectoris	7,340	9,394
Heart failure	25,136	19,849
Cerebrovascular diseases	13,903	15,889
Diabetes mellitus	7,089	6,240
Kidney and urinary tract infection	4,635	8,366
Other HACSC	0,092	0,087

ACSC: ambulatory care sensitive conditions; COPDs: chronic obstructive pulmonary diseases; HACSC: hospitalizations for ambulatory care sensitive conditions.

Table 4. Annual rate variation in mortality of older adults, according to gender, age group, and ambulatory care sensitive conditions in Santa Catarina, 2008–2015. Florianópolis, 2016.

Variables	Variation 2008–2015	(95%CI)
Deaths – ACSC	-2,4^	(-4.1; 0.6)
Deaths – females	-2.1	(-0.5; -3.6)
Deaths – males	-2,7^	(-4.7; -0.7)
Deaths – 60 to 79 years	-3,9^	(-5.5; -2.3)
Deaths – 80 years or older	5.9	(-30.0; 60.2)

95%CI: confidence interval of 95%; ACSC: ambulatory care sensitive conditions.

DISCUSSION

The number of older adults in Santa Catarina shows a fast-increasing trend, and the state has the highest life expectancy at birth in Brazil, reaching 78.74 years in 2015, while the national average was 75.44 years[14]. The 2012–2015 State Health Plan of Santa Catarina expressed constant concern with the hospital care situation, which gets almost 70% of public expenditure on health in the state[15]. In the problematics of hospitalizations, the financial burden is not the only aspect that deserves attention, but also the impact of hospitalization on the lives of older adults, as other studies have indicated[5,7,16,6].

The Directive No. 221 of April 17, 2008, of the Secretariat of Health Care (*Secretaria de Atenção à Saúde* – SAS) created an official list of ACSCs, which reflected the reality of health in the Brazilian territory. It was also established that this list should be adopted "as an evaluation tool for primary care and/or use of hospital care, which can be applied to assess the performance of the health system on a National, State, and Municipal basis"[9].

Increasing efforts seek ways to help evaluate the performance of the health system in order to qualify and implement public policies, humanize care, and reduce unnecessary hospitalizations. The organization of the Brazilian health system has been changing over the years, currently establishing the configuration of health care networks, and placing primary care in a central position as care coordinator and not just as the main access to the system[17].

Several studies point to a positive relationship between larger population coverage by teams of the Family Health Strategy (FHS) and lower rates of HACSCs. In the state of Rio Grande do Sul, a study showed a decrease in HACSCs among older adults after implementation of the FHS[18]. Data from the Ministry of Health reveal that the population covered by FHS teams in Brazil increased from 4% in 1998 to 63% in 2015; in Santa Catarina, this number reaches 80%[19].

The three studies found in the literature[18,20,21] specifically with people aged 60 years or older corroborate the results found in this work, indicating a reduction in hospitalization rates for ACSCs. However, despite having decreased in Santa Catarina, HACSCs are still responsible for one in every three general hospitalizations among older adults.

The group of individuals aged 80 years or older has shown greater variation in admissions after 2013, making the reduction in rates lower than that of older adults aged 60 to 79 years. This result deserves attention, as this population group tends to grow considerably in the state in the next few years.

Studies conducted in Rio de Janeiro, Rio Grande do Sul, and São Paulo also indicate heart failure, COPDs, and cerebrovascular diseases as the most prevalent causes[20,21]. International studies have also demonstrated concern about these diseases. For instance, a large part of the 39 studies of an important systematic review focused on pneumonia, COPDs, or heart failure[22].

A study carried out with 50 patients (66% of older adults) hospitalized with a diagnosis of COPD in two hospitals in Florianópolis revealed that the disease was classified as severe or very severe in most individuals, 33% of them were smokers, only 32% were instructed to receive the influenza vaccine, and 28% received pneumococcal vaccine. Low schooling

and income, and lack of oxygen therapy support and influenza vaccine were associated with inadequate treatment[23]. Factors related to existing limitations in health care are also found in other countries. A study conducted in 13 European countries with 16,018 patients diagnosed with COPD found that the main factors associated with prolonged length of stay were related to the severity or exacerbation of the disease. With effective and timely health care, these individuals should not reach the hospital unit so debilitated[24].

A systematic review mainly including studies from the United States, United Kingdom, and Canada demonstrated a significant relationship between geographic variation and admission rates for ACSCs, indicating that easy access to secondary care and inadequate primary care quality were often cited as the main factors for variation in admission rates[22].

After exploring the organizational aspects of primary care related to preventable hospitalizations, another systematic review corroborated Brazilian and other international studies regarding the benefits of care access and continuity in reducing hospitalization for ACSCs. The study mentions that an accessible and continuous primary care system proved to be more important in decreasing potentially preventable hospitalizations than how it is organized[25].

Cardiovascular diseases represent a significant proportion of hospitalizations for ACSCs. According to the 2012-2015 State Plan of Santa Catarina, hospitals face difficulties in meeting the demand for surgeries due to the lack of equipment and human resources and the inadequate physical structure of operating rooms. These deficiencies prolong the waiting period for surgery, and, for older adults, that leads to admission and readmission to stabilize and/or monitor the disease.

The variation in mortality rates for ACSCs in Santa Catarina decreased, except for individuals aged 80 years or older. This result differs from the study by Santos et al.[18], which found an increase in mortality rates for ACSCs related to cardiovascular diseases in people older than 60 years in some cities of Rio Grande do Sul. It is noteworthy that the number of studies addressing this issue in older adults is strictly limited.

CONCLUSION

Analyzing the ACSC indicator, which evaluates the quality and effectiveness of primary care, the results of this research revealed a reduction in hospitalization and mortality rates among older adults, regardless of gender and age groups established in this study, except for mortality rates in individuals aged 80 years or older. This finding demonstrates the progress of primary care and the Brazilian health system with respect to its reorganization and implications for the life of older adults.

Public policies need to continue advancing to fit the world outlook on aging. Undoubtedly, knowledge about HACSCs is a valuable tool in managing assistance, directing health care as it reveals the reality experienced and identifies the improvements still necessary.

We suggest that more studies investigate ambulatory care sensitive hospitalizations, due to their magnitude regarding the autonomy and dependence of older adults; the advances

in Brazilian public policies associated with primary care and humanization of care; and the factors related to the increase in hospitalizations for bacterial pneumonia, angina, cerebrovascular diseases, and kidney and urinary tract infections.

REFERENCES

1. Veras R. A urgente e imperiosa modificação no cuidado à saúde da pessoa idosa. ver Bras Geriatria Gerontol [Internet] 2015 [acessado em 11 nov. 2016]; 18(1): 5-6. Disponível em: http://www.scielo.br/pdf/rbgg/v18n1/1809-9823-rbgg-18-01-00005.pdf http://dx.doi.org/10.1590/1809-9823.2015.0059
2. Instituto Brasileiro de Geografia e Estatística. Síntese de indicadores sociais: uma análise das condições de vida da população brasileira [Internet]. Rio de Janeiro: Instituto Brasileiro de Geografia e Estatística; 2013 [acessado em 11 nov. 2016]. (Estudos e Pesquisas Informação Demográfica e Socioeconômica, 32). Disponível em: http://biblioteca.ibge.gov.br/visualizacao/livros/liv66777.pdf
3. Santos M dos. Epidemiologia do envelhecimento. In: Nunes MI, Ferreri REL, Santos M dos, eds. Enfermagem em geriatria e gerontologia. Rio de Janeiro: Guanabara Koogan; 2012. p. 4-8.
4. Silveira RE da, Santos AS, Sousa MC, Monteiro TSA. Gastos relacionados a hospitalizações de idosos no Brasil: perspectivas de uma década. Einstein [Inteenet] 2013 [acessado em 11 nov. 2016]; 11(4): 514-20. Disponível em: http://www.scielo.br/pdf/eins/v11n4/19.pdf
5. Borges EM, Placeres AF, Kuga JY, Ferreira S, Bianchin MA, Lamari NM. Diminuição da funcionalidade em idosos reinternados. Arq Ciênc Saúde [Internet] 2015 [acessado em 11 nov. 2016]; 22(2): 38-41. Disponível em: http://www.cienciasdasaude.famerp.br/index.php/racs/article/view/140/pdf_24 https://doi.org/10.17696/2318-3691.22.2.2015.140
6. Carretta MB, Bettinelli LA, Erdmann AL, Higashi GDC, Santos JLG. Compreendendo o significado do ser idoso vivenciando sua autonomia na hospitalização. Rev Rene [Internet] 2013 [acessado em 11 nov. 2016]; 14(2): 331-40. Disponível em: http://www.redalyc.org/pdf/3240/Resumenes/Resumen_324027986011_1.pdf
7. Wilson RS, Herbert LE, Scherr PA, Dong X, Leurgens SE, Evans DA. Cognitive decline after hospitalization in a community population of older persons. Neurology 2012; 78(13): 950-6. https://dx.doi.org/10.1212%2FWNL.0b013e31824d5894
8. Nedel FB, Facchini LA, Martin M, Navarro A. Características da atenção básica associadas ao risco de internar por condições sensíveis à atenção primária: revisão sistemática da literatura. Epidemiol Serv Saúde [Internet] 2010 [acessado em 11 nov. 2016]; 19(1): 61-75. Disponível em: http://scielo.iec.pa.gov.br/pdf/ess/v19n1/v19n1a08.pdf http://dx.doi.org/10.5123/S1679-49742010000100008
9. Alfradique ME, Bonolo PF, Dourado I, Lima-Costa MF, Macinko J, Mendonça CS, et al. Internações por condições sensíveis à atenção primária: a construção da lista brasileira como ferramenta para medir o desempenho do sistema de saúde (Projeto ICSAP-Brasil). Cad Saúde Pública [Internet] 2009 [acessado em 11 nov. 2016]; 25(6): 1337-49. Disponível em: http://www.scielo.br/pdf/csp/v25n6/16.pdf
10. Pagotto V, Silveira EA, Velasco WD. Perfil das hospitalizações e fatores associados em idosos usuários do SUS. Ciênc Saúde Coletiva [Internet] 2013 [acessado em 11 nov. 2016]; 18(10): 3061-70. Disponível em: http://www.scielo.br/pdf/csc/v18n10/v18n10a31.pdf
11. Brasil. Lei nº 8.842, de 4 de janeiro de 1994. Dispõe sobre a política nacional do idoso, cria o Conselho Nacional do Idoso e dá outras providências [Internet]. Brasil; 1994 [acessado em 11 nov. 2016]. Disponível em: http://www.planalto.gov.br/ccivil_03/leis/L8842.htm
12. Brasil. Ministério da Saúde. Portaria nº 221, de 17 de abril de 2008, que define a Lista Brasileira de Internações por Condições Sensíveis à Atenção Primária. Diário Oficial da União [Internet] 2008 [acessado em 11 nov. 2016]; (75): 70. Disponível em: http://www.saude.pr.gov.br/arquivos/File/CIB/Portaria_SAS_N_221_08_Lista_Internacoes_Condicoes_Sensiveis_Atencao_Basica.pdf
13. Doll R, Payne P, Waterhouse J, eds. Cancer Incidence in Five Continents: A Technical Report. Berlim: Springer-Verlag (for UICC); 1966.
14. Instituto Brasileiro de Geografia e Estatística. Projeção da população por sexo e idade para o período de 2000/2060; Projeção da população das unidades da federação por sexo e idade para o período 2000/2030 [Internet]. Rio de Janeiro: Instituto Brasileiro de Geografia e Estatística; 2013 [acessado em 11 nov. 2016]. Disponível em: ftp://ftp.ibge.gov.br/Projecao_da_Populacao/Projecao_da_Populacao_2013/nota_metodologica_2013.pdf

15. Santa Catarina. Secretaria de Estado da Saúde. Plano Estadual de Saúde 2012 – 2015. Florianópolis: Secretaria de Estado da Saúde; 2011.
16. Caldas CP, Veras RP, Motta LB, Lima KC, Kisse CBS, Trocado CVM, et al. Rastreamento do risco de perda funcional: uma estratégia fundamental para a organização da Rede de Atenção ao Idoso. Ciên Saúde Colet [Internet] 2013 [acessado em 11 nov. 2016]; 18(12): 3495-506. Disponível em: http://www.scielo.br/scielo.php?script=sci_abstract&pid=S1413-81232013001200006&lng=en&nrm=iso&tlng=en http://dx.doi.org/10.1590/S1413-81232013001200006
17. Brasil. Ministério da Saúde. Portaria nº 2.488, de 21 de outubro de 2011. Aprova a Política Nacional de Atenção Básica, estabelecendo a revisão de diretrizes e normas para a organização da Atenção Básica, para a Estratégia Saúde da Família (ESF) e o Programa de Agentes Comunitários de Saúde (PACS). Diário Oficial da República Federativa do Brasil [Internet] 2011 [acessado em 12 nov. 2016. Disponível em: http://www.saude.mt.gov.br/upload/legislacao/2488-[5046-041111-SES-MT].pdf
18. Santos VCF, Kalsing A, Ruiz ENF, Roese A, Gerhardt TE. Perfil das internações por doenças crônicas não-transmissíveis sensíveis à atenção primária em idosos da Metade Sul do RS. Rev Gaúcha Enferm [Internet] 2013 [acessado em 11 nov. 2016]; 34(3): 124-31. Disponível em: http://seer.ufrgs.br/RevistaGauchadeEnfermagem/article/view/35838/27273
19. Brasil. Ministério da Saúde. Histórico de cobertura saúde da família [Internet]. Brasília: Ministério da Saúde; 2013 [acessado em 11 nov. 2016]. Disponível em: http://dab.saude.gov.br/portaldab/historico_cobertura_sf.php
20. Marques AP, Montilla DER, Almeida WS, Andrade CLT. Internação de idosos por condições sensíveis à atenção primária à saúde. Rev Saúde Pública [Internet] 2014 [acessado em 11 nov. 2016]; 48(5): 817-26. Disponível em: http://www.scielo.br/pdf/rsp/v48n5/pt_0034-8910-rsp-48-5-0817.pdf http://doi.org/10.1590/S0034-8910.2014048005133
21. Muraro CF, Gigante LP, Nedel FB, Carvalho TGMI, Domenech SC, Gevaerd MS. Estratégia saúde da família e as internações por condições sensíveis à atenção primária nos idosos. Rev Baiana Saúde Pública [Internet] 2013 [acessado em 11 nov. 2016]; 37(1): 20-33. Disponível em: http://files.bvs.br/upload/S/0100-0233/2013/v37n1/a3813.pdf
22. Busby J, Purdy S, Hollingworth W. A systematic review of the magnitude and cause of geographic variation in unplanned hospital admission rates and length of stay for ambulatory care sensitive conditions. BMC Health Serv Res [Internet] 2015 [acessado em 15 dez. 2017]; 15: 324. Disponível em: https://doi.org/10.1186/s12913-015-0964-3
23. Giacomelli IL, Steidle LJM, Moreira FF, Meyer IV, Souza RG, Pincelli MP. Pacientes portadores de DPOC hospitalizados: análise do tratamento prévio. J Bras Pneumol [Internet] 2014 [acessado em 11 nov. 2016]; 40(3): 229-37. Disponível em: http://www.scielo.br/scielo.php?pid=S1806-37132014000300229&script=sci_arttext&tlng=pt http://dx.doi.org/10.1590/S1806-37132014000300005
24. Ruparel M, López-Campos JL, Castro-Acosta A, Hartl S, Pozo-Rodriguez F, Roberts CM. Understanding variation in length of hospital stay for COPD exacerbation: European COPD audit. ERJ Open Res [Internet] 2016 [acessado em 11 nov. 2016]; 2: 00034-2015. Disponível em: https://doi.org/10.1183/23120541.00034-2015
25. Van Loenen T, Berg MJ, Westert GP, Faber MJ. Organizational aspects of primary care related to avoidable hospitalization: a systematic review. Fam Pract [Internet] 2014 [acessado em 20 dez. 2017]; 31(5): 502-16. Disponível em: https://doi.org/10.1093/fampra/cmu053

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