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Research Article

Hospitalizations due to ambulatory care sensitive conditions in the municipality of Gramado, Rio Grande do Sul, Brazil

Internações por condições sensíveis à atenção primária no município de Gramado/RS

Hospitalización por condiciones sensibles a la atención primaria en el municipio de Gramado, Rio Grande do Sul, Brasil

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Abstract

Introduction: Primary Health Care is responsible for coordinating care and providing continuous care for the population under its responsibility. Due to its proximity and connection with the community and knowledge of the territory's main problems, the Family Health Strategy presents greater problem-solving capacity of health demands, thus reducing the burden on medium- and high-complexity services. To assess whether Primary Health Care has performed its role with effectiveness and quality, instruments capable of verifying this situation in a simple and concise way are necessary. One of them is the Hospitalizations due to Ambulatory Care Sensitive Conditions. **Objective:** To analyze the reasons for hospitalization due to ambulatory care sensitive conditions in Gramado, state of Rio Grande do Sul – Brazil, from 2015 to 2021. **Methods:** Ecological time series study, with a quantitative approach and descriptive characteristic. Data were collected from the Hospital Information System from SUS and the Brazilian List of Ambulatory Care Sensitive Conditions package program was used in the R program, which converts the data of all hospitalizations by municipality of reference through the Inpatient Hospital Authorization. For data analysis, the research was divided into two axes: clinical-epidemiological and demographic aspects. The causes of hospitalizations due to ambulatory care sensitive conditions were based on the list of the Brazilian Ministry of Health. **Results:** Hospitalizations due to ambulatory care sensitive conditions accounted for 22% (14,083) of the total number of hospitalizations in the city of Gramado. There were more hospitalizations of women (54.1%) compared with men (45.9%). The three main groups with the highest percentage of hospitalization due to ambulatory care sensitive conditions were pulmonary diseases (18.4%), followed by heart failure (17.6%), and kidney and urinary tract infection (14.7%). The age group with the highest prevalence was users aged 60 years or older (57.6%), followed by those aged 20 to 59 years (30.7%), and 0 to 4 years (6.7%). **Conclusions:** The results of the behavior of hospitalizations in Gramado in the analyzed years point to a reduction in their proportion in relation to the total number of hospitalizations in the city, but when evaluating the standardized rates by sex and city population, these rates are stable throughout the assessed years.

Keywords: Primary health care; Delivery of Health Care; Hospitalization; Family health.

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Resumo

Introdução: A Atenção Primária à Saúde é a responsável pela coordenação do cuidado e por realizar a atenção contínua da população que está sob sua responsabilidade. Por sua proximidade e vinculação com a comunidade e conhecimento sobre os principais problemas do território, a Estratégia Saúde da Família apresenta maior resolutividade das demandas de saúde, reduzindo, assim, a sobrecarga nos serviços de média e alta complexidade. Para avaliar se a Atenção Primária à Saúde tem desempenhado seu papel com efetividade e qualidade, são necessários instrumentos capazes de verificar de maneira simples e concisa tal situação. Um deles é o de Internações por Condições Sensíveis à Atenção Primária. **Objetivo:** Analisar os motivos de internação por condições sensíveis à Atenção Primária à Saúde em Gramado, Rio Grande do Sul, no período de 2015 a 2021. **Métodos:** Estudo ecológico de série temporal, com abordagem quantitativa e característica descritiva. Os dados foram coletados do Sistema de Internações Hospitalares do SUS e utilizou-se o programa Pacote Lista Brasileira de Internações por Condições Sensíveis à Atenção Primária no programa R, o qual faz a conversão dos dados de todas as internações por município de referência por meio da Autorização de Internação Hospitalar. Para análise dos dados, a pesquisa foi dividida em dois eixos: clínico-epidemiológico e aspectos demográficos. As causas de internações por condições sensíveis à atenção primária foram baseadas na lista do Ministério da Saúde. **Resultados:** As internações sensíveis à atenção primária representaram 22% (14.083) do total de internações do município de Gramado. Houve mais internações do sexo feminino (54,1%), quando comparado ao masculino (45,9%). Os três principais grupos com maior porcentagem de internação por condições sensíveis à atenção primária foram as doenças pulmonares (18,4%), seguidas de insuficiência cardíaca (17,6%), infecção no rim e trato urinário (14,7%). A faixa etária com maior prevalência foi a de usuários com 60 anos ou mais (57,6%), seguida à de 20 a 59 anos (30,7%) e à de 0 a 4 anos (6,7%). **Conclusões:** Os resultados do comportamento das internações em Gramado nos anos analisados apontam uma redução da proporção delas em relação ao total de internações no município, mas quando avaliadas as taxas padronizadas por sexo e população do município, há uma estabilidade dessas taxas ao longo dos anos analisados.

Palavras-chave: Atenção primária em saúde; Atenção à Saúde; Hospitalização; Saúde da família.

Resumen

Introducción: La Atención Primaria de Salud es la encargada de coordinar la atención y realizar la atención continua a la población bajo su responsabilidad. Por su proximidad y conexión con la comunidad y el conocimiento de los principales problemas del territorio, la Estrategia Salud de la Familia presenta mayor resolución de demandas de salud, reduciendo, así, la sobrecarga en los servicios de mediana y alta complejidad. Para evaluar si la Atención Primaria de Salud ha cumplido su función con eficacia y calidad, se necesitan instrumentos capaces de verificar esta situación de forma sencilla y concisa. Uno es el de Internaciones por Condiciones sensibles a la Atención Primaria. **Objetivo:** Analizar los motivos de internación por condiciones sensibles a la Atención Primaria a la Salud en Gramado, Rio Grande do Sul, en el periodo de 2015 a 2021. **Métodos:** Estudio ecológico de serie temporal, con abordaje cuantitativo y carácter descriptivo. Los datos fueron recolectados del Sistema de Internaciones Hospitalarias del Sistema Único de Salud y se utilizó el programa Paquete Lista Brasileña de Internaciones por Condiciones Sensibles a la Atención Primaria en el programa R, lo cual hace la conversión de los datos de todas las internaciones por municipio de referencia a través de la Autorización de Internación Hospitalaria. Para el análisis de los datos, la investigación se dividió en dos ejes: clínico-epidemiológico y aspectos demográficos. Las causas de internaciones por condiciones sensibles a la atención primaria se basaron en la lista del Ministerio de Salud. **Resultados:** Las internaciones sensibles a la atención primaria representaron el 22% (14.083) del total de internaciones en la ciudad de Gramado. Hubo más internaciones por personas del sexo femenino (54,1%), en comparación con las personas de sexo masculino (45,9%). Los tres principales grupos con mayor porcentaje de internación por condiciones sensibles a la atención primaria fueron las enfermedades pulmonares (18,4%), seguidas de insuficiencia cardiaca (17,6%), infección renal y del tracto urinario (14,7%). La franja etaria con mayor prevalencia fue la de usuarios con 60 años o más (57,6%), seguida de 20 a 59 años (30,7%) y la de 0 a 4 años (6,7%). **Conclusiones:** Los resultados del comportamiento de las hospitalizaciones en Gramado en los años analizados apuntan a una reducción de su proporción con relación al total de hospitalizaciones del municipio, pero cuando se evalúan las tasas estandarizadas por sexo y población del municipio, hay una estabilidad de estas tasas a lo largo de los años analizados.

Palabras clave: Atención primaria de salud; Atención a la salud; Hospitalización; Salud de la familia.

INTRODUCTION

Primary Health Care (PHC) is the first level of health care in Brazil and is the main gateway to the Brazilian Unified Health System (SUS). PHC is responsible for coordinating care and providing continuous care to the population under its responsibility.[1] In this context, in order to work on PHC actions in the country, the Brazilian Family Health Program (FHP) was defined, later expanded to the current Family Health Strategy (FHS), with the purpose of guiding and standardizing PHC actions, defining reference teams, operation territories, and attributes of the work process.[2] The FHS is responsible for the access, prevention, treatment, cure, and rehabilitation of users through teamwork processes.[3]

Due to its proximity and connection with the community and knowledge of the main problems in the territory, the FHS, when articulated with the other points of the comprehensive healthcare network, presents greater problem-solving capacity of health demands, thus reducing the burden on medium- and high-complexity services.[3]

To assess whether PHC has performed its role effectively and with quality, instruments capable of verifying this situation in a simple and concise way are necessary.[4] One of them is the Hospitalizations due to Ambulatory Care Sensitive Conditions (ACSC). In Brazil, the conceptual framework for the creation of this indicator followed the model proposed by Caminal-Homar & Casanova-Matutano and was adapted to the country's conditions, consolidated in the Brazilian Ministry of Health Ordinance SAS/MS No. 221 of April 17, 2008, which established the Brazilian List of ACSC.[5,6]

This indicator is based on the principle that hospitalizations due to preventable conditions may indicate problems related to the primary care network, considering that these health conditions, which evolved into hospitalization, cover a range of diseases that can be prevented and controlled by timely and decisive PHC.[7,8] In addition, the coefficient generated by the ACSC is an easy-to-operate and low-cost indicator that can indicate knowledge of the health system in a timely manner, enabling to assess its effectiveness.[3]

Municipalities that are organized into a health system structured by PHC and which have good coverage (over 70%), according to the FHS model, show lower rates of hospital admission for causes and a considerable reduction in health costs.[2] Brazil has an estimated FHS coverage of 76.1%, with the Northeast region having the highest coverage, with 87.1%. The state of Rio Grande do Sul (RS) has a coverage of 63.7%.[9]

The city of Gramado, 12 years after the creation of the list, has no publication on the results of the use of ACSC in municipal health services, which is a problem to be faced. The lack of existence of these data makes it difficult to assess the performance of the municipality's healthcare network. In this context, the study is justified by the need to advance the discussion about such a health indicator to support managers in the decision-making process regarding the adequate planning of health actions. The general objective of this research was to analyze the causes for hospitalization due to ACSC in the city of Gramado/RS, from 2015 to 2021, and its specific objectives were to describe the distribution, by sex and age group, of ACSC groups and the evolution of the ACSC coefficient during the study period.

METHODS

This is a time-series ecological study with a quantitative approach and descriptive characteristic, which aimed to analyze hospitalizations due to ambulatory care sensitive conditions (ACSC) in the city of Gramado/RS, from 2015 to 2021. Located in the state's 23rd Health Region, Gramado has an estimated population of 36,864 inhabitants for the year 2021 with Human Development Index (HDI) of 0.764.[10]

The municipality's health network includes one health surveillance center, one Psychosocial Care Center, five Health Centers, and six Family Health Teams (FHT), in addition to one medium-sized philanthropic hospital with 98 beds, 57 of which destined for SUS hospitalizations.

Secondary data related to ACSC were obtained from the SUS Hospital Information System (*Sistema de Informações Hospitalares* – SIH/SUS), which processes Inpatient Hospital Authorization (*Autorização de Internação Hospitalar* – AIH) forms, using the csapAIH Package program, which converts data from all hospitalizations per reference municipality, that is, hospitalizations of users from Gramado, admitted to

any institution in the state.[11] The Microsoft Excel software (2010 version) was used for tabulating the data, doing calculations, and producing graphs according to the proposed objectives.

ACSC causes were based on the Brazilian List of Ambulatory Care Sensitive Conditions, composed of 19 diagnostic groups divided into 120 groups of the International Classification of Diseases – Tenth Revision (ICD-10), excluding groups related to childbirth (ICD-10 O-80 to O-84), as it is a natural pregnancy outcome, which does not constitute an illness.

ACSC rates were estimated by dividing the number of hospitalizations due to diseases in the groups described in this list by the population estimated by the Brazilian Institute of Geography and Statistics (IBGE) in the respective years; subsequently, they were stratified by sex and age group.

To assess the PHC coverage, the authors used the database provided for public consultation in the website *e-Gestor Atenção Básica – Informação e Gestão da Atenção Básica* (space gathering information on and access to systems of the Primary Health Care).

For data analysis, the research was divided into two axes: clinical-epidemiological and demographic aspects. In the first axis, the leading causes of hospitalizations were identified according to chapters of the ICD-10 during the studied period; in the second axis, the demographic aspects were analyzed according to the variables of age group and sex.

The census consists of the total number of hospitalizations of the population living in the municipality, included in the investigation period; as it is an ecological study in which the records are fully available, analyzing the data in their entirety provided greater robustness to the inferences.

There was no need for approval of the Human Research Ethics Committee of Universidade Federal do Rio Grande do Sul, as the present study uses secondary data from the public domain with unrestricted access, with no ethical implications regarding the approach to human beings.

RESULTS

Between January 1st, 2015 and December 31, 2021, 14,083 hospital admissions were registered in the city of Gramado/RS. Of these, 22% (2,516) were hospitalizations due to ambulatory care sensitive conditions. (Table 1)

When evaluating the *e-Gestor* platform, the FHT coverage in the municipality increased from 10.4% (2015) to 41.3% (2020) during the study period, totaling four teams based in Gramado/RS. Despite the high

Table 1. Number of hospitalizations due to ambulatory care sensitive conditions and other conditions, 2015 to 2021. Gramado/RS, Brazil.

TOTAL NUMBER OF HOSPITALIZATIONS FOR RESIDENTS OF THE CITY OF GRAMADO/RS, 2015-2021.																
Conditions	**2015**		**2016**		**2017**		**2018**		**2019**		**2020**		**2021**		**TOTAL**	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Ambulatory care sensitive conditions	339	22	361	21	414	22	405	20	423	18	305	14	269	12	2516	18
Other conditions	1218	78	1329	79	1508	78	1636	80	1907	82	1903	86	2067	88	11568	82
TOTAL	1557	100	1689	100	1922	100	2041	100	2330	100	2208	100	2336	100	14083	100
ACSC PROPORTION	27.83		27.16		27.45		24.76		22.18		16.03		13.01		21.75	

ACSC: Ambulatory Care Sensitive Conditions.
Source: SIH/SUS–DATASUS. Brazil. ICSAP.

coverage of PHC, the municipality maintains some programmatic areas focused on medical specialties and not on primary care units such as prenatal care and childcare. (Table 2).

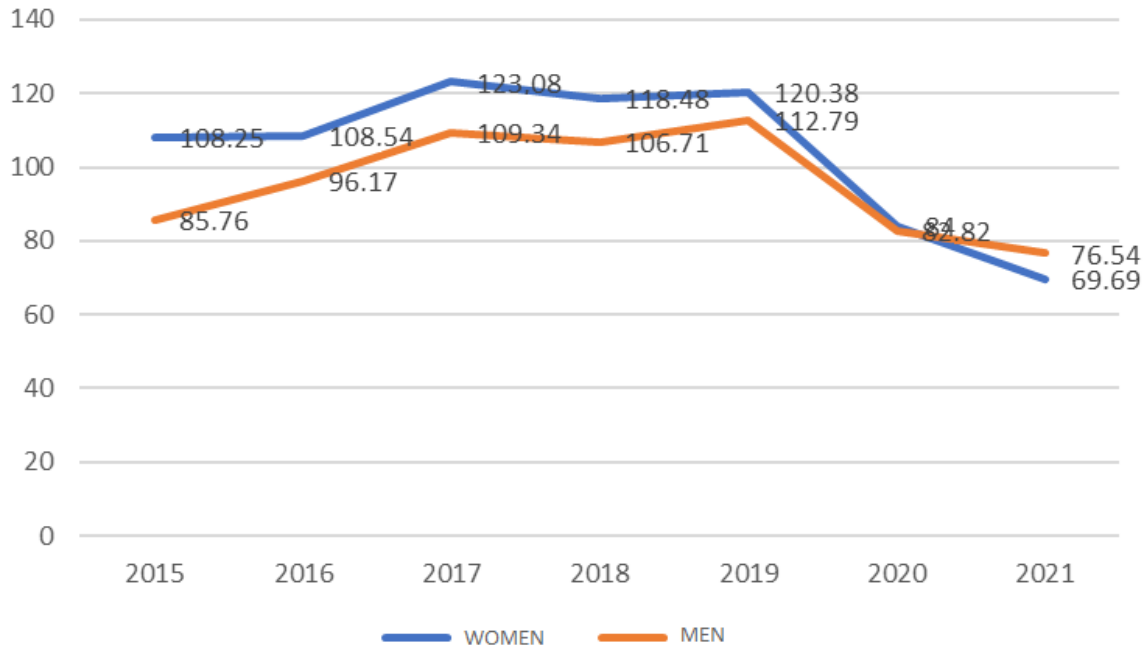
Table 2. Population and coverage of family health teams and equivalent team from 2015 to 2021. Gramado/RS, Brazil.

YEAR	POPULATION	FHT	EQUIVALENT TEAM	FHT COVERAGE (%)	PHC COVERAGE (%)
2015	34,365	1	5	10.4	54
2016	34,605	1	6	9.9	63.1
2017	34,832	1	6	9.9	67.5
2018	35,047	6	5	58.2	100
2019	35,875	6	6	56.9	100
2020	36,232	4	8	41.3	97
2021	36,232	6	3	57.9	35.6

FHT: Family Health team; PHC: Primary Health Care.
The 2015–2020 data from *e-Gestor* includes all teams registered in the National Registry of Health Establishments. The 2021 data, on the other hand, considers only funded teams.

Considering the diagnostic rates, the group with the highest percentage of hospitalization due to ACSC were lung diseases (18.4%), followed by heart failure (17.6%), kidney and urinary tract infection (14.7%), cerebrovascular diseases (9.7%), and diabetes mellitus (5.4%).

In Figure 1 we show the standardized ACSC rates stratified by sex, which at the beginning of the study year accounted for 108.25 per 10 thousand inhabitants for women and 85.76 per 10 thousand inhabitants for men, reaching, in 2021, values of 69.69 per 10 thousand inhabitants for women and 76.54



Source: SIH/SUS–DATASUS and IBGE.
Figure 1. Standardized rate of Ambulatory Care Sensitive Conditions by sex per 10 thousand inhabitants, reference population from the 2010 Census, 2015 to 2021. Gramado/RS, Brazil.

per 10 thousand inhabitants for men. These rates demonstrate stability in the years 2017 to 2019, with the increase in FHT coverage and a reduction in the years 2020 and 2021, which can be attributed to the reduction in access to hospitalizations due to the new coronavirus (COVID-19) pandemic.

The main causes for hospitalization among women were: kidney and urinary tract infection (20.7%), heart failure (17.7%), and lung diseases (15.7%). Conversely, for men, we identified three main causes for hospitalization: lung diseases (21.7%), heart failure (17.5%), and cerebrovascular diseases (9.1%). (Table 3)

Table 3. Hospitalizations due to Ambulatory Care Sensitive Conditions, according to age group and diagnostic group from 2015 to 2021. Gramado/RS, Brazil.

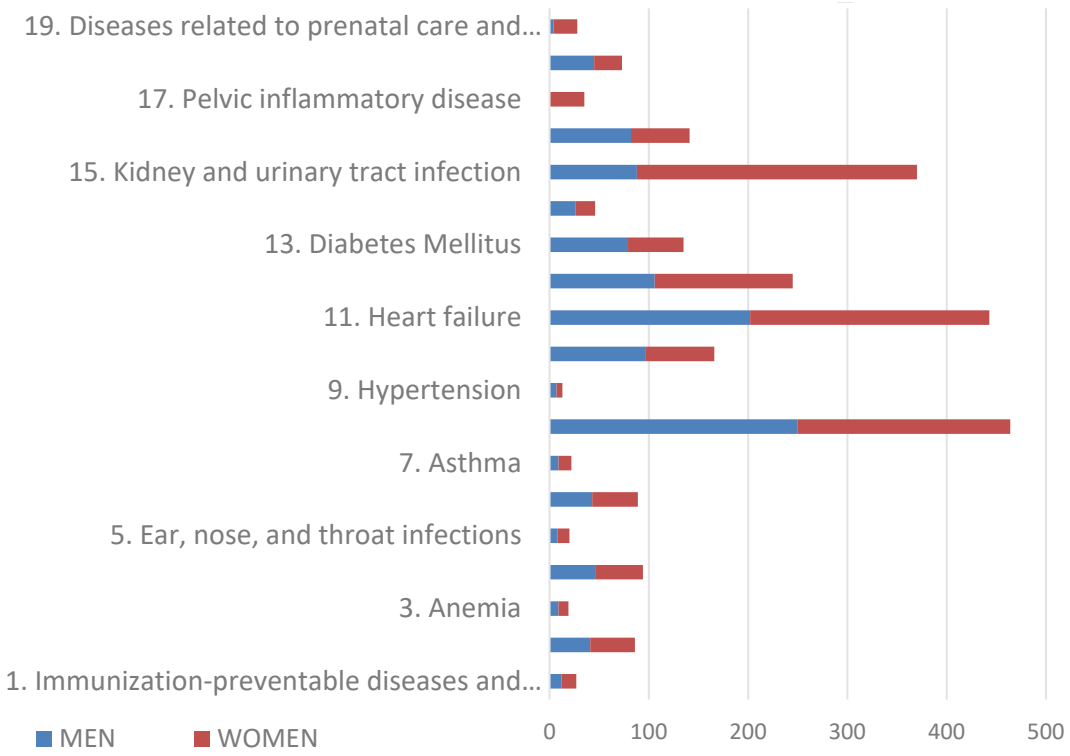
	0-4 years	5-9 years	10-19 years	20-59 years	60-79 years	>80 years	Total
1. Immunization-preventable diseases and sensitive conditions	5	0	4	13	4	1	27
2. Infectious gastroenteritis and complications	20	6	8	28	14	10	86
3. Anemia	1	1	0	6	7	4	19
4. Nutritional deficiencies	1	0	1	19	35	32	88
5. Ear, nose, and throat infections	7	1	2	8	2	0	20
6. Bacterial pneumonias	3	0	3	18	44	21	89
7. Asthma	8	5	2	5	1	1	22
8. Lung diseases	82	7	4	80	191	100	464
9. Hypertension	0	0	0	6	7	0	13
10. Angina	0	0	0	78	72	16	166
11. Heart failure	0	0	0	43	223	177	443
12. Cerebrovascular diseases	0	0	0	59	115	71	245
13. Diabetes Mellitus	2	4	4	59	49	17	135
14. Epilepsies	9	5	4	21	6	1	46
15. Kidney and urinary tract infection	9	8	35	181	84	54	371
16. Skin and subcutaneous tissue infection	8	2	4	82	35	9	140
17. Pelvic inflammatory disease	0	0	4	28	3	0	35
18. Gastrointestinal ulcer	2	0	1	28	30	12	73
19. Diseases related to prenatal care and childbirth	12	0	4	11	1	0	28
Total	169	39	86	773	923	526	2516

Source: SIH/SUS0020 — DATASUS. Brazil.

By analyzing ACSC according to sex, we verified more hospitalizations of women (54.1%) compared with men (45.9%). (Figure 2)

When analyzing the age group during the study period, a higher number of hospitalizations can be observed among users aged 60 and over (57.6%), followed by 20 to 59 years (30.7%), and 0 to 4 years (6.7%). (Table 4)

When analyzing the distribution by age group, three diagnostic groups represent 60.5% of ACSC in the older population: heart failure (27.6%), lung diseases (20.1%), and cerebrovascular diseases (12.8%). In the adult age group (20 to 59 years), hospitalization for kidney and urinary tract infection predominates (23.4%), followed by skin and subcutaneous tissue infection (10.6%) and lung diseases (10.3%). In the



Source: SIH/SUS–DATASUS. Brazil.
Figure 2. Hospitalizations due to Ambulatory Care Sensitive Conditions, according to sex and diagnostic group from 2015 to 2021. Gramado/RS, Brazil.

age group of 0 to 4 years, there was a prevalence of lung diseases (48.5), followed by gastroenteritis (11.8%) and diseases related to prenatal care and childbirth (7.1%).

DISCUSSION

Considering the proportion of ACSC in relation to the total number of registered hospitalizations, this proportion varied from 27.9% in 2015 to 13% in 2021. This datum demonstrates the participation of ACSC with regard to all hospitalizations during the analyzed period.

Regarding the standard ACSC rates in the studied years, there was a small increase in the rates as of 2017, which occurs simultaneously with the increase in Family Health coverage, which is higher among women than men. The rates stabilized in the years 2018 and 2019, and dramatically decreased in 2020 and 2021. However, in those years, this decline is due to the reduction in access to hospital admissions due to the COVID-19 pandemic.

In Brazil, we can observe the historical trend in the period from 2001 to 2016, which indicates a reduction in the standard rate of hospitalizations due to ACSC (from 120 to 66 hospitalizations per 10 thousand inhabitants, a reduction of 45%); a situation also observed in the average of the capitals (which decreased by 24%) and in small municipalities (which decreased by 48.6%).[12] This reduction in the number of hospitalizations may be a consequence of the increase in FHT coverage in the country. Municipalities with lower FHT coverage had higher hospitalization rates due to sensitive conditions, which shows difficulty in accessing the health system and/or its poor performance.[12]

Table 4. Distribution of absolute and relative frequencies of Ambulatory Care Sensitive Conditions from 2015 to 2021. Gramado/RS, Brazil.

ACSC Group	2015		2016		2017		2018		2019		2020		2021		TOTAL	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
1. Immunization-preventable diseases and sensitive conditions	3	0.86	1	0.28	2	0.56	0	0.00	2	0.55	18	4.92	1	0.27	27	1.07
2. Infectious gastroenteritis and complications	7	2.01	7	1.99	17	4.78	13	3.62	21	5.80	11	3.01	10	2.71	86	3.42
3. Anemia	3	0.86	3	0.85	0	0.00	3	0.84	3	0.83	5	1.37	2	0.54	19	0.76
4. Nutritional deficiencies	6	1.72	16	4.55	10	2.81	32	8.91	22	6.07	7	1.91	1	0.27	94	3.74
5. Ear, nose, and throat infections	5	1.44	1	0.28	8	2.25	3	0.84	2	0.55	1	0.27	0	0.00	20	0.79
6. Bacterial pneumonias	3	0.86	2	0.57	24	6.75	31	8.64	16	4.42	8	2.19	5	1.36	89	3.54
7. Asthma	2	0.57	3	0.85	1	0.28	3	0.84	4	1.10	4	1.09	5	1.36	22	0.87
8. Lung diseases	40	11.49	79	22.45	91	25.60	67	18.67	81	22.36	53	14.50	53	14.38	464	18.44
9. Hypertension	0	0.00	2	0.57	3	0.84	3	0.84	2	0.55	1	0.27	2	0.54	13	0.52
10. Angina	16	4.60	34	9.66	27	7.60	18	5.01	26	7.18	18	4.92	27	7.32	166	6.60
11. Heart failure	97	27.87	74	21.03	66	18.57	50	13.93	63	17.39	48	13.13	45	12.21	443	17.61
12. Cerebrovascular diseases	21	6.03	46	13.07	38	10.69	56	15.60	29	8.00	23	6.29	32	8.68	245	9.74
13. Diabetes Mellitus	29	8.33	17	4.83	26	7.31	15	4.18	19	5.24	14	3.83	15	4.07	135	5.37
14. Epilepsies	12	3.45	4	1.14	9	2.53	4	1.11	6	1.66	10	2.74	1	0.27	46	1.83
15. Kidney and urinary tract infection	56	16.09	47	13.36	48	13.50	50	13.93	73	20.15	43	11.76	53	14.38	370	14.71
16. Skin and subcutaneous tissue infection	29	8.33	14	3.98	23	6.47	27	7.52	26	7.18	15	4.10	7	1.90	141	5.60
17. Pelvic inflammatory disease	3	0.86	0	0.00	7	1.97	10	2.79	9	2.48	5	1.37	1	0.27	35	1.39
18. Gastrointestinal ulcer	7	2.01	10	2.84	13	3.66	18	5.01	12	3.31	7	1.91	6	1.63	73	2.90
19. Diseases related to prenatal care and childbirth	0	0.00	1	0.28	1	0.28	2	0.56	7	1.93	14	3.83	3	0.81	28	1.11
TOTAL	339	97.40	361	102.59	414	116.48	405	112.83	423	116.75	305	83.44	269	72.97	2516	100.00

Source: SIH/SUS–DATASUS. Brazil.

Recent studies conducted in the country show a decline in ACSC, related to the strengthening and expansion of PHC, especially after adopting the FHT as a healthcare policy.[13] Nevertheless, according to the author, it is necessary to assess the timing of the organization of the systems and the strength of PHC, considering that, in places with limited access, the implementation of FHT may, at first, increase ACSC by identifying situations that have not yet been monitored.[14]

PHC coverage in Gramado, during the studied period, increased from 54% in 2015 to 97% in 2020. Although the studies show reductions in ACSC, this research showed that there was a decline related to the expansion of PHC, especially the FHT, but this can only be analyzed with larger time series.

The groups associated with chronic noncommunicable diseases, focusing on heart diseases, such as heart failure, angina, cerebrovascular diseases, and hypertension, were mainly responsible for the increase in ACSC.[15] A research conducted in the state of Pernambuco (Brazil) found heart failure as the second leading cause of hospitalization among older adults, which is also true for Brazil.[16] This result is in line with what we found in the present study, as heart failure is also the second leading cause of ACSC, second only to lung diseases, constituting one of the most prevalent diseases in the general population, especially among older adults, challenging the system due to its complications. Considering this significant proportion, we suggest evaluating the population under 65 years of age, as there may be a tendency to increase the length of hospitalization and readmissions, as well as greater worsening of illnesses and greater comorbidities, which has an impact on the reduction of PHC, in addition to making it difficult to analyze the leading cause and even overestimate the risk of hospitalization.[5]

Chronic respiratory diseases, such as chronic obstructive pulmonary disease and asthma, although with few studies on their prevalence, have decreased in age-adjusted mortality rates (28.2 and 34.1%, respectively).[17] The highest number of lung diseases may be related to the Southern region of Brazil, especially the Serra Gaúcha (mountainous region in northeastern Rio Grande do Sul), because there are daily climate variations with a large temperature range and harsh winters with cold and dry air masses, which contribute to the triggering and/or worsening of respiratory diseases.[18]

The hypertension group, despite being common among the Brazilian population, showed a low frequency of hospitalization in this study, that is, its annual percentage was below 1% of total hospitalizations, which shows quality in the care network with effective involvement in strategic programmatic actions.

Conversely, diabetes mellitus was significant (5.4%) in the number of hospitalizations in the municipality. Similar data found in the literature shows that, in Brazil, the associated mortality increased by 8% between 2000 and 2007, and of all hospitalizations, 7.4% are attributed to diabetes.[19]

In the analysis of ACSC by sex, kidney and urinary tract infections are most prevalent among women, which can be attributed to peculiarities in the anatomy of the female urinary system.[20] There is a difference between sexes, but infectious diseases are more related to the exacerbation of other vulnerabilities, such as older people with dehydration, whose increased water intake at home is capable of reducing hospitalization rates due to kidney and urinary tract infections and dehydration. Intervening quickly and with quality in the face of infectious complications in vulnerable people with chronic uncontrolled diseases, whose health condition worsens with complications, such as pneumonia, kidney and urinary tract infections, dehydration, and skin and subcutaneous tissue infections, is the function of PHC, as the technologies for treating these diseases are available and are specific to this level of care.[14]

A study conducted on ACSC in Brazil and Portugal verified a similarity in the distribution between sex and age group — that is, women and older adults were the most hospitalized during the studied period. Women accounted for more than half of all preventable hospitalizations for older age groups in both

countries.[21] One of the reasons for the overburden of services in this age group may be related to the current population aging, which indicates the need to intensify public policies aimed at this demographic risk profile.[22]

When assessing the age group from 0 to 4 years, the most expressive group was 19 (diseases related to prenatal care and childbirth) and the ICD most found in this category was A509 (congenital syphilis), with 12 hospitalizations: 2017, one; 2019, four; 2020, five; and 2021, two, a condition which has evolved with an increase over the evaluated period. This finding is similar to a study conducted nationally in 2020, in which there was an increase in ACSC rates among neonates, with congenital syphilis as the leading cause.[17] Even in this age group, with regard to infectious gastroenteritis, there are important regional differences due to socioeconomic, demographic, and biological determinants.[4] Thus, its occurrence is directly related to sanitary sewer coverage, access to drinking water, education level of the population, and the scope of PHC, especially with immunization against rotavirus.

The reduction in preventable hospitalizations can be attributed to the improvement of social determinants of health and the expansion of access to PHC services, which includes an increase in immunization coverage, the number of prenatal care and childcare visits, among other collective health actions, in addition to intersectoral coordination, as structural and organizational problems persist, which affect the effectiveness of these actions in the country.[23]

With regard to gastroenteritis, its occurrence is directly related to sanitary sewer coverage, education level of the population, and FHT coverage.[13] Thus, its reduction as a cause of hospitalization is due both to improvements in social conditions, such as the reduction of poverty and social inequalities, and to investments in the sanitary and health conditions of the population such as the increase in the FHT coverage.[5] It should be noted that PHC, as the gateway to SUS, has the potential to prevent gastroenteritis by health education, as well as to avoid hospitalizations and worsening the child's clinical condition by using soft technologies available to them.

PHC must be organized in an articulated and intersectoral way, seeking support from other network services, both in the social sphere and economic development, in such a way it can act more effectively and improve the population's quality of life, thus expanding the range of problem-solving capacity and, consequently, reducing hospitalization rates for conditions that should be resolved and monitored by this level of care.

As a result, a systematic review showed that changes in ACSC rates are not limited to the coverage or expansion of the FHS and suggests that this correlation should not be analyzed in isolation, but rather verifying the multiplicity of elements represented by socioeconomic, demographic, provision, or barriers variables from other health services and even specific to the patient such as age and education..[23,24] This research has limitations inherent to studies with secondary data, susceptible to underreporting, and concerning the validity of the identification of the underlying cause of hospitalizations. The limitations were reduced by rigorous quality analyses and specific searches aimed at reducing the total number of biases. However, it is important to reaffirm that, despite limitations in the ACSC analysis, this source provides solid elements for assessing the performance of PHC and can be used as a tool for public managers to developt their planning and management processes.

CONCLUSION

The results of the behavior of hospitalizations in Gramado in the analyzed years point to a reduction in their proportion in relation to the total number of hospitalizations in the city, but when evaluating the standardized rates by sex and city population, these rates are stable throughout the assessed years.

The three main groups with the highest percentage of hospitalization due to ACSC were pulmonary diseases (18.4%), followed by heart failure (17.6%), and kidney and urinary tract infection (14.7%). Older adults are the most vulnerable to ACSC, demonstrating the need for measures in the PHC that can improve the provision of care for this population, preventing unnecessary hospitalizations, which will consequently reduce the costs financed by SUS.

Considering its association with the expansion of PHC coverage during the studied period, a more adequate provision of healthcare services may have a significant part for this result.

CONFLICT OF INTERESTS

Nothing to declare.

AUTHORS' CONTRIBUTIONS

GMZ: Conceptualization, Data curation, Formal analysis, Writing – original draft. CSM: Conceptualization, Formal analysis, Methodology.

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