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Hospitalization profile of older adults enrolled in the supplementary primary care program in Vale do Aço/MG

Perfil de internação de pacientes idosos acompanhados pelo programa de atenção primária suplementar no Vale do Aço/MG

Perfil de la hospitalización de los ancianos seguidos por el programa de atención primaria complementaria en Vale do Aço/MG

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Abstract

Introduction: Hospitalization in the elderly can be a complex event and result in functional decline in these people. Thus, Primary Health Care (PHC) stands out for its potential to reduce hospitalizations by intervening in Ambulatory Care Sensitive Conditions (ACSC), which are an important cause of hospitalizations. **Objective:** The objective of this study is to describe the epidemiological and sociodemographic profile of hospitalization of elderly patients followed by a supplementary primary care program in 2019, evaluating hospitalizations due to ACSC and the Clinical Functional Vulnerability Index (IVCF-20). This is a descriptive, cross-sectional and quantitative study using secondary data collected from the institutional system's database. Quantitative statistical analysis was performed, consistent with the descriptive study, obtaining percentages, mean and standard deviation. **Results:** Of the target population, 1,838 elderly people were hospitalized in 2019, with a majority of female patients (53.2%) and a mean age of 72.41 years. In all, records of 2,607 hospitalizations were recorded, with a predominance of cardiovascular diseases. Of the hospitalizations, 27.3% were due to ACSC, with emphasis on bacterial pneumonia. Regarding the IVCF-20, half of the sample showed low vulnerability, 34% medium vulnerability and 16% high vulnerability. About half (51%) of the elderly aged 80 years or older had high clinical and functional vulnerability, as well as 57% of those who had 3 hospitalizations or more in the analyzed period also had this classification. **Conclusion:** It was concluded that the sociodemographic and epidemiological profile was similar to that found in the literature, while the rate of hospitalizations due to ACSC were lower than those described within the Unified Health System. Knowing the characteristics and prevalence of hospitalization of the elderly population can help and guide the planning of care and the approach to be taken with each individual within primary care according to the result.

Keywords: Primary health care; Aging; Frailty; Hospitalization.

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Resumo

Introdução: A internação hospitalar em idosos pode ser um evento complexo e resultar em declínio funcional nestas pessoas. Assim, a Atenção Primária à Saúde (APS) ganha destaque pelo potencial de reduzir as internações ao intervir em condições sensíveis à atenção primária (CSAP), que são causa importante de hospitalizações. **Objetivo:** O objetivo deste estudo é descrever o perfil epidemiológico e sociodemográfico de internação de pacientes idosos acompanhados por um programa de atenção primária suplementar em 2019, avaliando internações por CSAP e Índice de Vulnerabilidade Clínico-Funcional (IVCF-20), além de conhecer a prevalência de ICSAP e de internações categorizada pelo IVCF-20. **Métodos:** Trata-se de um estudo descritivo, transversal e quantitativo que utiliza dados secundários por meio da coleta no banco de dados do sistema institucional. Foi realizada análise estatística, condizente com o estudo descritivo, obtendo-se porcentagens, média e desvio padrão (DP). **Resultados:** Da população alvo, 1.838 idosos estiveram internados em 2019, com composição majoritária de pacientes do sexo feminino (53,2%) e idade média de 72,41 anos. Ao todo, foram contabilizados registros de 2.607 internações, com predomínio por doenças cardiovasculares. Das internações, 27,3% foram por CSAP, com destaque para pneumonias bacterianas. Com relação ao IVCF-20, metade da amostra apresentou baixa vulnerabilidade, 34% média vulnerabilidade e 16% alta vulnerabilidade. Cerca de metade (51%) dos idosos com 80 anos ou mais apresentaram alta vulnerabilidade clínico-funcional, assim como 57% dentre os que tiveram três internações ou mais no período analisado também tinham tal classificação. **Conclusão:** Concluiu-se que o perfil sociodemográfico e epidemiológico foi semelhante ao encontrado na literatura, ao passo que a taxa de internações por CSAP foi menor do que a descrita no âmbito do Sistema Único de Saúde. Conhecer as características e prevalências de internação da população idosa pode auxiliar e nortear o planejamento dos cuidados e a abordagem a ser realizada com cada indivíduo no escopo da atenção primária, de acordo com o resultado.

Palavras-chave: Atenção primária à saúde; Envelhecimento; Fragilidade; Hospitalização.

Resumen

Introducción: La hospitalización en ancianos puede ser un evento complejo y resultar en declive funcional en estas personas. Así, la Atención Primaria de Salud (APS) se destaca por su potencial para reducir las hospitalizaciones al intervenir en condiciones sensibles a la atención primaria (ACSC), que son una causa importante de hospitalizaciones. **Objetivo:** El objetivo de este estudio es describir el perfil epidemiológico y sociodemográfico de la hospitalización de pacientes adultos mayores seguidos de un programa de atención primaria complementaria en 2019, evaluando las hospitalizaciones por ACSC y el Índice de Vulnerabilidad Clínica Funcional (IVCF-20). Se trata de un estudio descriptivo, transversal y cuantitativo utilizando datos secundarios recolectados de la base de datos del sistema institucional. Se realizó análisis estadístico cuantitativo, acorde con el estudio descriptivo, obteniendo porcentajes, media y desviación estándar. **Resultados:** De la población objetivo, 1838 adultos mayores fueron hospitalizados en 2019, con una mayoría de pacientes del sexo femenino (53,2%) y una edad promedio de 72,41 años. En total se registraron registros de 2.607 hospitalizaciones, con predominio de las enfermedades cardiovasculares. De las hospitalizaciones, 27,3% fueron por ACSC, con énfasis en neumonía bacteriana. En cuanto al IVCF-20, la mitad de la muestra mostró vulnerabilidad baja, 34% vulnerabilidad media y 16% vulnerabilidad alta. Cerca de la mitad (51%) de los ancianos con 80 años o más presentaron alta vulnerabilidad clínica y funcional, así como 57% de los que tuvieron 3 hospitalizaciones o más en el período analizado también tuvieron esta clasificación. **Conclusión:** Se concluyó que el perfil sociodemográfico y epidemiológico fue similar al encontrado en la literatura, mientras que la tasa de hospitalizaciones por ACSC fue inferior a las descritas dentro del Sistema Único de Salud. Conocer las características y prevalencia de la hospitalización de la población anciana puede ayudar y orientar la planificación de los cuidados y el abordaje a realizar con cada individuo dentro de la atención primaria según el resultado.

Palabras clave: Atención primaria de salud; Envejecimiento; Fragilidad; Hospitalización.

INTRODUCTION

Although increased longevity and the consequent growth of the aged population can be attributed to advances in medicine, substantial challenges remain regarding the health of this population. From a biological perspective, aging is understood as a natural process characterized by a progressive decline in individuals' functional reserve, referred to as senescence. However, conditions of overload, such as illnesses, accidents, and emotional stress, may lead to a pathological state requiring assistance, known as senility. This scenario reflects the reality of a significant proportion of older adults who are exposed to multiple chronic comorbidities, vulnerabilities, and states of frailty

Therefore, understanding the inherent aspects of aging and identifying individual limitations based on reliable indicators are essential to support the allocation of resources and the development of care

programs for those at greater risk of adverse outcomes, such as reduced functional capacity and death, as well as to promote actions aimed at preventing these outcomes.[1]

To comprehensively and objectively screen frail older adults or those at risk of frailty, validated instruments have been developed, including the Clinical-Functional Vulnerability Index (IVCF-20). The IVCF-20 was designed for the Brazilian older adult population and encompasses multidimensional aspects, comprising 20 questions distributed across eight sections: age (one question), self-perceived health (one question), functional disabilities (four questions), cognition (three questions), mood (two questions), mobility (six questions), communication (two questions), and multiple comorbidities (one question). Each section is assigned a specific score, resulting in a maximum total of 40 points. The risk of clinical-functional vulnerability in older adults increases as the final score rises.[2]

Using this instrument, individuals can be stratified according to their level of vulnerability, both quantitatively and qualitatively (low, moderate, or high vulnerability), allowing the assessment of functional decline — at the time of evaluation — and comparatively over the long term, as the instrument is recalculated during longitudinal follow-up. Its use supports care planning and informs the approach to be adopted for each individual within the scope of primary care, according to the obtained result. In addition, it guides the recommendation of personalized preventive measures based on the patient's conditions and enables the identification and monitoring of groups at higher risk of excessive use of healthcare services and hospitalization, which is considered a major factor among the highly complex events associated with senility.[2,3]

The Ministry of Health, through Ordinance No. 221 of April 17, 2008, established the list of Ambulatory Care Sensitive Conditions(*Condições Sensíveis à Atenção Primária* – CSAP).[4] The term Hospitalizations for Ambulatory Care Sensitive Conditions(*Internações por Condições Sensíveis à Atenção Primária* – HACSC) is used to distinguish, among the various causes of hospital morbidity, those conditions that can be effectively addressed in a timely manner through Primary Health Care (PHC).[5] Accordingly, through actions focused on disease prevention, early diagnosis and treatment of acute conditions, as well as the control and monitoring of chronic diseases, PHC has a distinct potential to mitigate patient harm and reduce hospitalizations resulting from these conditions.[6]

Within the context of the Brazilian Unified Health System (*Sistema Único de Saúde* — SUS), a longitudinal ecological study conducted in the city of Belo Horizonte analyzed sociodemographic and health data from 2017 to 2021 and identified associations between the availability of family and community physicians in PHC teams and lower rates of HACSC.[7]

Usifamília is a supplementary primary care program of the São Francisco Xavier Foundation, operated through the *Usisaúde* health insurance provider. Its activities are carried out at *Usisaúde* facilities, and it comprises teams consisting of family physicians, nurses, nursing technicians, and a multidisciplinary team (nutritionists, clinical pharmacists, care navigators, and social workers). The program includes a Chronic Conditions Care Management Program and, in the care of older adults, has incorporated, among other initiatives, the IVCF-20.[8]

It is understood that analyzing the hospitalization profile of older adults followed by *Usifamília* may improve the identification of populations at higher risk of illness and support the implementation of measures to organize care and preventive interventions, thereby ensuring that priority-setting and decision-making are conducted in an equitable and efficient manner — in addition, such analysis contributes to depicting the current panorama of care within supplementary PHC, given the scarcity of literature in this sector.

This study aimed to describe the epidemiological and sociodemographic profile of hospitalizations among older adults followed by *Usifamília* in 2019 and to determine the prevalence of HACSC and hospitalizations categorized according to IVCF-20.

METHODS

An observational, cross-sectional, quantitative study was conducted using secondary data extracted from reports generated by the health management and information system of the São Francisco Xavier Foundation.

As the *Usisaúde* health insurance provider operates under a vertically integrated model in the Vale do Aço/MG, the study population was defined as older adults hospitalized in 2019 at *Hospital Márcio Cunha* (HMC) and *Hospital e Maternidade Vita Brasil* (HMVB) who were enrolled in the supplementary primary care service *Usifamília*. The sample consisted of patients with complete data available in the institutional information system records.

The following inclusion criteria were adopted for sample selection:

- hospitalization in a ward or intensive care unit between January 2019 and December 2019;
- age 60 years old or older;
- enrollment in the *Usifamília* Supplementary Primary Health Care program.

Patients whose records in the institutional system indicated a length of hospital stay of less than 24 hours due to discharge or death, as well as those with incomplete or illegible data (including medical record number, age, gender, clinical diagnosis, length of stay, and IVCF classification), were excluded from the study.

The information was obtained from institutional system records through inpatient spreadsheets and patient records of individuals enrolled in the *Usifamília* program in 2019. Initially, reports were cross-referenced to identify older adults followed by *Usifamília* who were hospitalized in 2019 at hospitals in the Vale do Aço region — HMC and HMVB. From these sources, the following data were extracted for hospitalized older adults during the study period: medical record number, age, gender, clinical diagnosis, frequency of hospitalization, length of stay, and IVCF.

Statistical analyses were performed using Microsoft Office Excel 2007®. Continuous variables were described using means and standard deviations, and categorical variables were expressed as counts and percentages in the presentation of tables and graphics. Data were analyzed according to: age (categorized as 60–69 years, 70–79 years, and ≥80 years), gender (male and female), clinical diagnosis, length of stay (categorized in days as: one day, two to seven days, eight to 15 days, and more than 15 days), frequency of hospitalization (categorized as one, two, or three or more hospitalizations per individual), and IVCF (qualitatively classified as low, moderate, or high vulnerability).

The clinical diagnosis variable was analyzed according to the chapters of the International Classification of Diseases and Related Health Problems, 10th edition (ICD-10) (Chart 1). In addition, diagnoses classified as HACSC were analyzed. For this purpose, the official list of CSAP was used (Chart 2), which comprises 19 groups of causes encompassing 74 diagnoses classified according to ICD-10.[4]

The study was approved by the Research Ethics Committee under approval number 5.176.597 on December 18, 2021.

Chart 1. List of causes of hospitalizations by group according to the International Classification of Diseases.

I.	Some infectious and parasitic diseases
II.	Neoplasms [tumors]
III.	Diseases of the blood and hematopoietic organs and certain immune disorders
IV.	Endocrine, nutritional, and metabolic diseases
V.	Mental and behavioral disorders
VI.	Diseases of the nervous system
VII.	Diseases of the eye and adnexa
VIII.	Diseases of the ear and mastoid process
IX.	Diseases of the circulatory system
X.	Diseases of the respiratory system
XI.	Diseases of the digestive system
XII.	Diseases of the skin and subcutaneous tissue
XIII.	Diseases of the musculoskeletal system and connective tissue
XIV.	Diseases of the genitourinary system
XVII.	Congenital malformations, deformations, and chromosomal abnormalities
XVIII.	Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified
XIX.	Injuries, poisonings, and certain other consequences of external causes
XX.	External causes of morbidity and mortality
XXI.	Factors influencing health status and contact with health services

Chart 2. List of Primary Care-Sensitive Conditions.

(Ordinance No. 221, April 17, 2008)	
Group	**Diagnoses**
1	Vaccine-preventable diseases and sensitive conditions
2	Infectious gastroenteritis and complications
3	Anemia
4	Nutritional deficiencies
5	Ear, nose, and throat infections
6	Bacterial pneumonias
7	Asthma
8	Pulmonary diseases
9	Hypertension
10	Angina
11	Heart failure
12	Cerebrovascular diseases
13	Diabetes *mellitus*
14	Epilepsies
15	Kidney and urinary tract infections
16	Kidney and urinary tract infections
17	Inflammatory disease of female pelvic organs
18	Gastrointestinal ulcer
19	Conditions related to prenatal care and childbirth

RESULTS

In 2019, 1,838 older adults monitored by *Usifamília* were admitted to HMC and HMVB. This number accounted for 35.14% of all patients, across all age groups, followed by this primary care service who were admitted to both hospitals in that year.

The study population consisted predominantly of female patients (53.2%), with a mean age of 72.41 years (SD 9.08). A detailed age distribution is presented in Table 1:

Table 1. Composition of patients by gender, age, and hospitalization frequency among older adults enrolled in the Usifamília program with hospitalizations in 2019.

Gender	N (%)
Female	978 (53.2)
Male	860 (46.8)
Age (years)	
60–69	837 (45.5)
70–79	564 (37.7)
80 or more	437 (23.8)
Hospitalization frequency per older adult	
1	1,355 (73.7)
2	313 (17)
3 or more	170 (9.2)

The number of hospitalizations per older adult ranged from one to eight in 2019. The mean number of hospitalizations per individual was 1.42 (SD 0.88), which is consistent with the observed frequency, as the majority of the population (73.7%) experienced only one hospitalization during the year.

With regard to age, analysis by age group showed that although the largest proportion of hospitalizations occurred among individuals aged 60 to 69 years (45.5%), a substantial rate was also observed among those aged 80 years old or older. In this group, 437 older adults were hospitalized at least once in 2019, representing 23.8% of all hospitalized older adults during the study period.

An analysis of age group and length of stay was also conducted, taking into account the total number of hospitalizations among older adults in 2019. In this context, a total of 2,607 hospitalizations were recorded in 2019 for the 1,838 patients evaluated.

Regarding length of stay, the mean duration was 4.8 days per hospitalization (SD 6.0), with a minimum of one day and a maximum of 90 days. As shown in Table 2, no significant difference in length of stay was observed between genders, with a mean of 4.77 days for females and 4.83 days for males.

When age groups were considered, differences in prevalence were observed primarily at the extremes. Among hospitalizations with a length of stay of one day, 58.9% involved individuals aged 60–69 years, whereas only 12.9% involved those aged 80 years old or older. In contrast, among hospitalizations lasting more than 15 days, 42.5% corresponded to very old adults aged 80 years old or older.

Hospitalizations were evaluated according to the clinical diagnosis variable, with diagnoses grouped by ICD-10 classification chapters (Chart 1). Causes were further analyzed by subdivision into HACSC and non-HACSC, based on the CSAP list (Chart 2), as presented in Table 3 and Figures 1 and 2.

Table 2. Length of hospital stay (in days) by age group among older adults enrolled in the Usifamília program with hospitalizations in 2019.

Length of stay (days)	N	(%)	60–69 years	70–79 years	80 years or more
1	822	(31.5)	484 (58.9)	232(28.2)	106(12.9)
2 to 7	1,320	(50.6)	446 (33.8)	425(32.2)	449 (34)
8 to 15	338	(13)	105(31.1)	109(32.2)	124(36.7)
More than 15	127	(4.9)	46(36.2)	27(21.3)	54(42.5)
Total hospitalizations	2,607	(100)	1,081 (41.5)	793 (30.4)	733 (28.1)

Among the 2,607 hospitalizations of older adults followed by the *Usifamília* program in the study year, analysis of hospitalization diagnoses showed that 713 (27.3%) were classified as HACSC, whereas 1,894 (72.7%) were classified as non-HACSC.

When all causes of hospitalization were considered, clinical diagnoses classified in Group IX, diseases of the circulatory system, exhibited the highest prevalence, accounting for 19% of hospitalization causes (Figure 1).

Table 3. Clinical diagnosis by International Classification of Diseases, 10th edition (ICD-10) (Hospitalizations for Ambulatory Care Sensitive Conditions (HACSC) *vs*. non-HACSC).

Clinical diagnosis by ICD-10 group	HACSC		Non-HACSC	
	N	(%)	N	(%)
I. Certain infectious and parasitic diseases	47	(1.8)	55	(2.1)
II. Neoplasms [tumors]	-	-	191	(7.3)
III. Diseases of the blood and hematopoietic organs and certain immune disorders	1	(0.0)	15	(0.6)
IV. Endocrine, nutritional, and metabolic diseases	26	(1.0)	76	(2.9)
V. Mental and behavioral disorders	-	-	19	(0.7)
VI. Mental and behavioral disorders	22	(0.8)	48	(1.8)
VII. Diseases of the eye and adnexa	-	-	73	(2.8)
VIII. Diseases of the ear and mastoid process	-	-	10	(0.4)
IX. Diseases of the circulatory system	262	(10.0)	233	(8.9)
X. Diseases of the respiratory system	203	(7.8)	74	(2.8)
XI. Diseases of the digestive system	33	(1.3)	171	(6.6)
XII. Diseases of the skin and subcutaneous tissue	11	(0.4)	22	(0.8)
XIII. Diseases of the musculoskeletal system and connective tissue	-	-	292	(11.2)
XIV. Diseases of the genitourinary system	108	(4.1)	134	(5.1)
XV. Pregnancy, childbirth, and the puerperium	-	-	-	-
XVI. Certain conditions originating in the perinatal period	-	-	-	-
XVII. Congenital malformations, deformations, and chromosomal abnormalities	-	-	10	(0.4)
XVIII. Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified	-	-	263	(10.1)
XIX. Injuries, poisonings, and certain other consequences of external causes	-	-	128	(4.9)
XX. External causes of morbidity and mortality	-	-	25	(1.0)
XXI. Factors influencing health status and contact with health services	-	-	55	(2.1)
Total	713 (27.3)			1,894 (72.7)

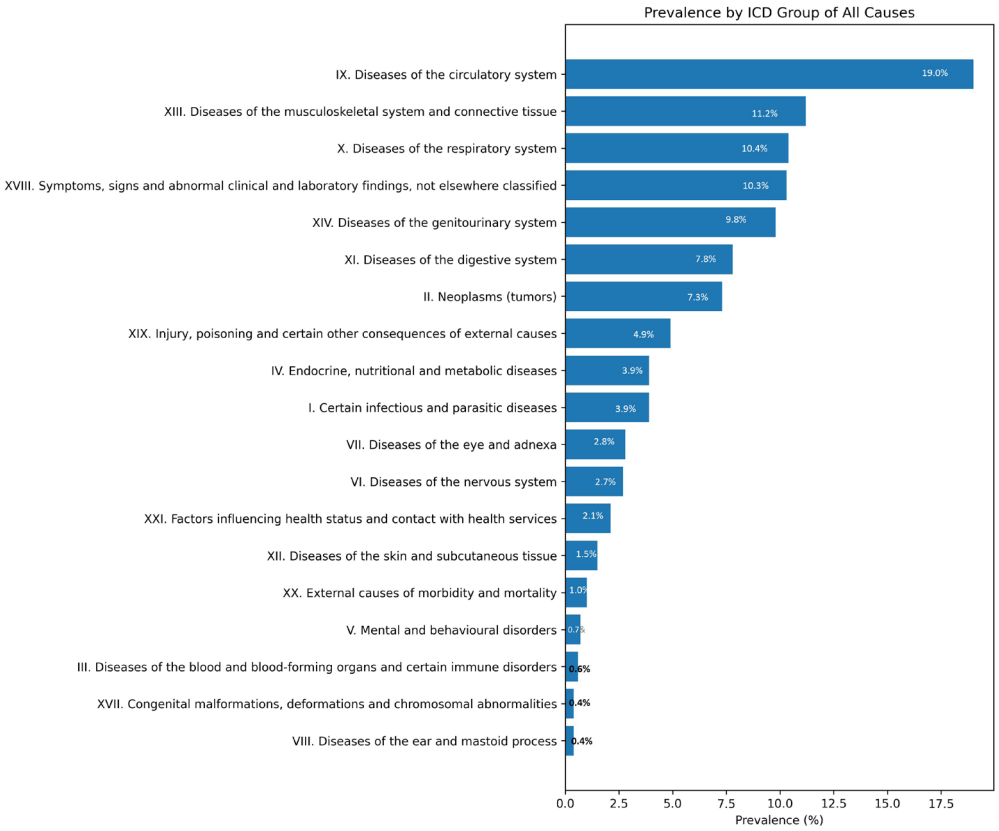

Figure 1. Prevalence by ICD group of all causes of hospitalization among elderly individuals monitored by Usifamília in 2019.

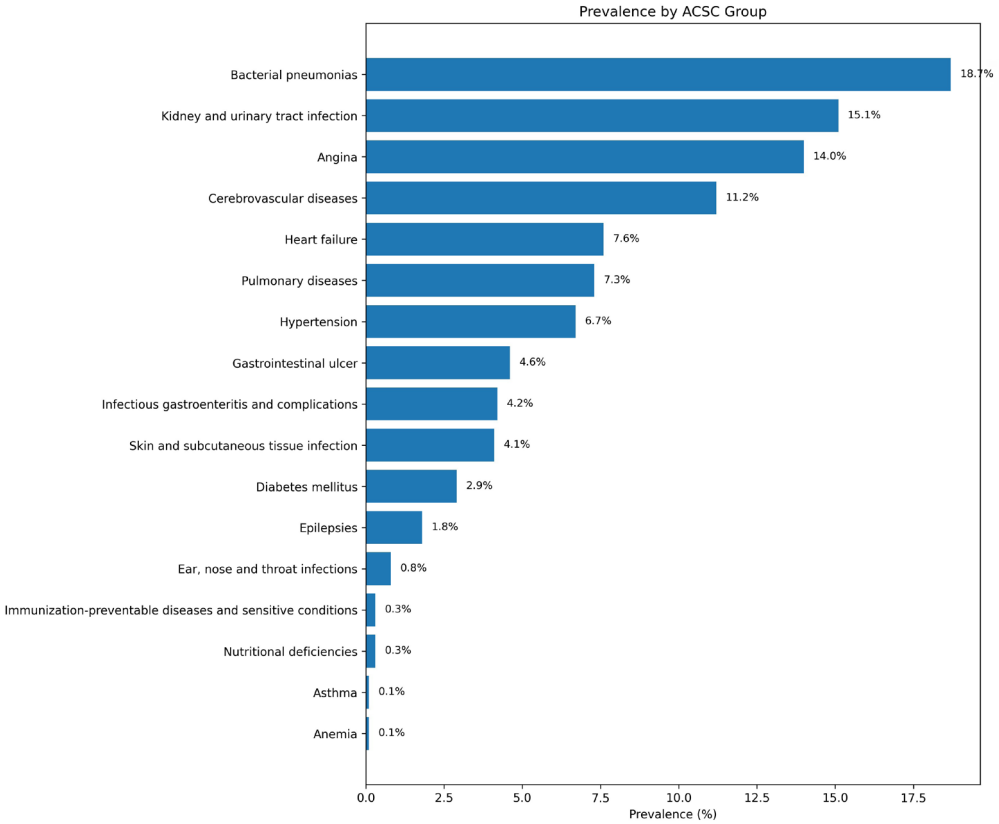

Figure 2. Prevalence of diagnoses for hospitalizations by group of Ambulatory Care Sensitive Conditions (ACSC) among older adults enrolled in the *Usifamília* program in 2019.

According to ICD-10 diagnostic groups (Table 3), within the non-HACSC category, the most prevalent conditions were diseases of the musculoskeletal system and connective tissue (11.2%), diseases of the circulatory system (8.9%), and diseases of the digestive system (6.6%). In comparison, HACSC showed a higher prevalence only for hospitalizations with diagnoses classified as diseases of the circulatory system (10% *vs*. 8.9%) and diseases of the respiratory system (7.8% *vs*. 2.8%).

HACSC were more prevalent among females (52.73%), particularly among individuals aged 80 years old or older, who accounted for 24.4% of all HACSC — detailed in Table 4 below.

Table 4. Prevalence of hospitalizations for Ambulatory Care Sensitive Conditions (HACSC) by gender and age group among older adults enrolled in the Usifamília program and hospitalized in 2019.

	Female N (%)	Male N (%)
60 to 69 years	102 (14.31)	110 (15.43)
70 to 79 years	100 (14.02)	115 (16.13)
80 years or more	174 (24.40)	112 (15.71)
Total	376 (52.73)	337 (47.27)

For improved interpretation of the HACSC analysis, hospitalization diagnoses within this group were subdivided according to the classification established by the Ministry of Health ordinance that regulates HACSC.[4] In addition, HACSC cases were stratified by gender and age group to examine their distribution across these categories (Figures 3, 4, 5, 6, and 7).

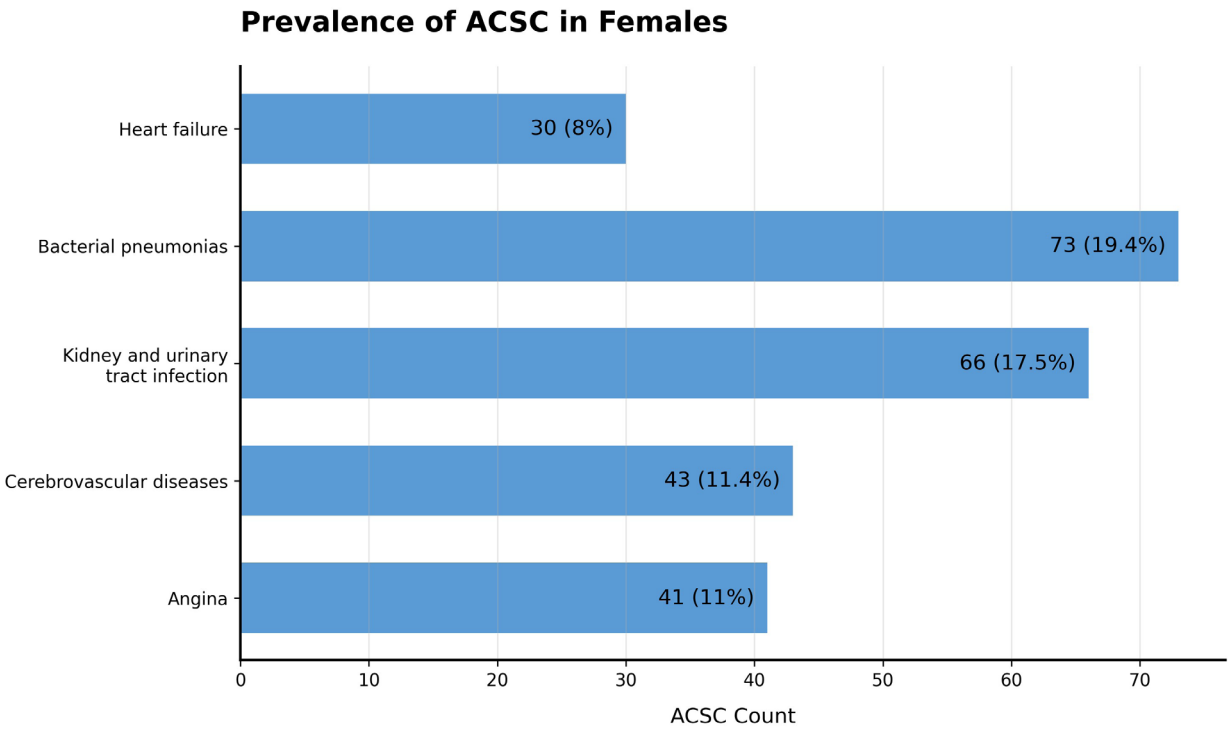

Figure 3. Prevalence of hospitalizations for Ambulatory Care Sensitive Conditions (ACSC) among female older adults enrolled in the *Usifamília* program in 2019.

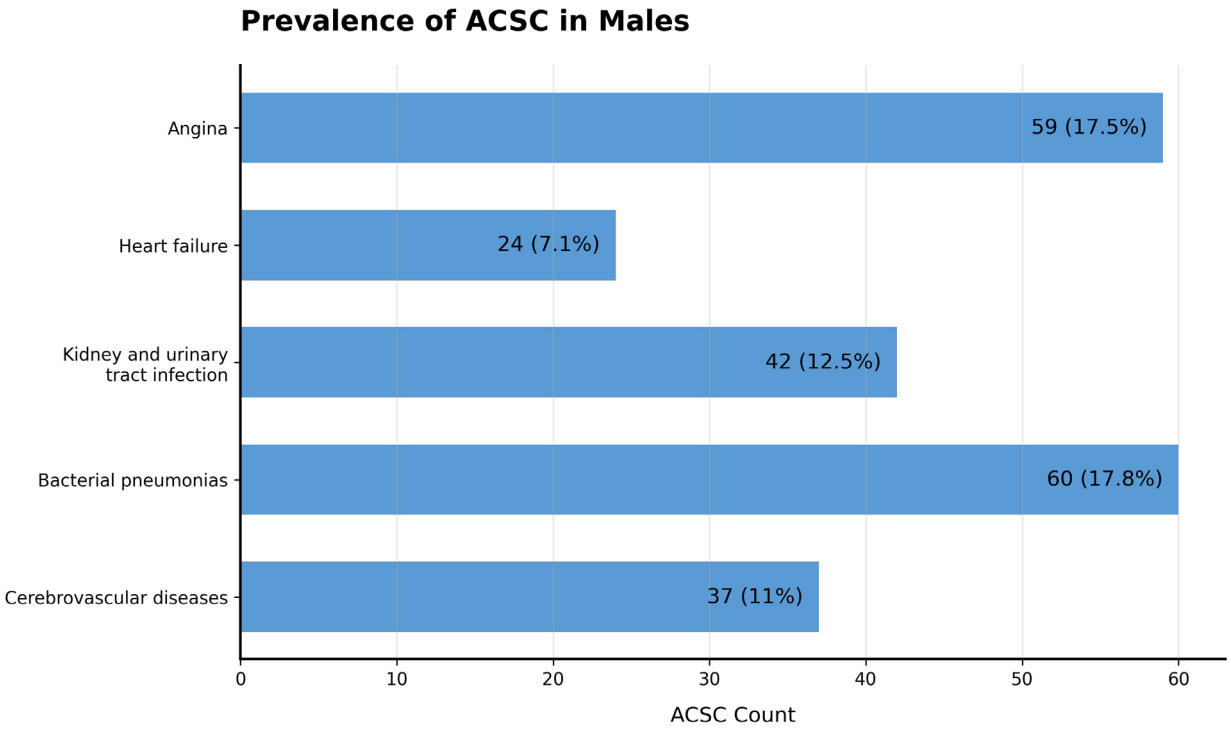

Figure 4. Prevalence of Hospitalizations for Ambulatory Care Sensitive Conditions (ACSC) among male older adults enrolled in the *Usifamília* program in 2019.

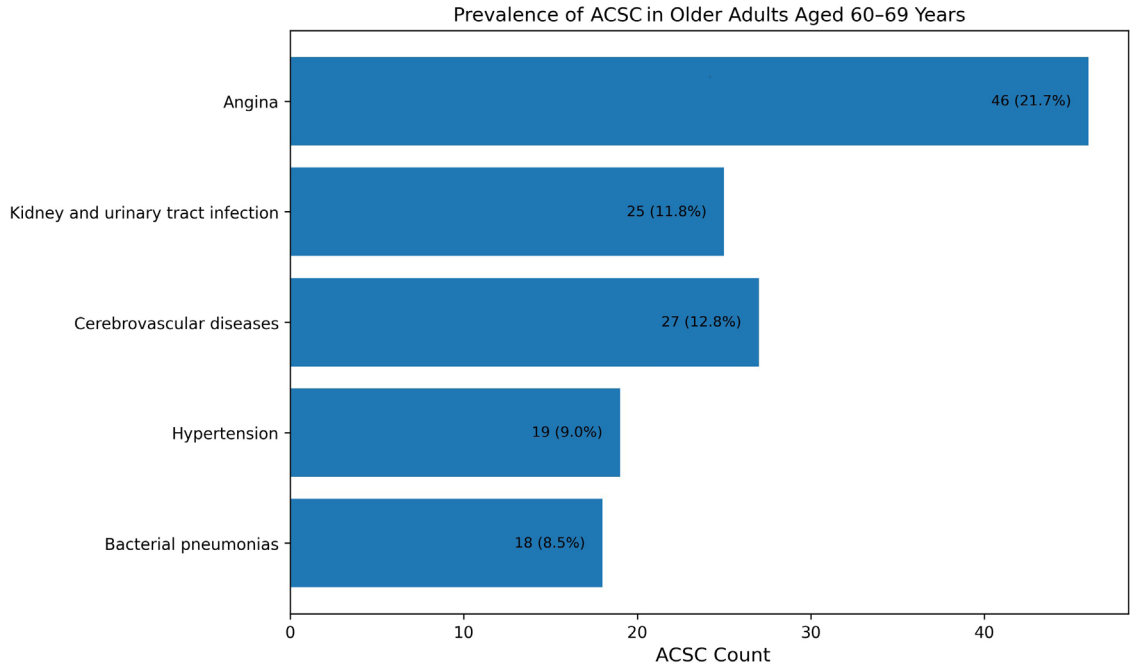

Figure 5. Prevalence of hospitalizations for Ambulatory Care Sensitive Conditions (HACSC) among older adults aged 60-69 years enrolled in the *Usifamília* program in 2019.

Thus, among the 713 hospitalizations for conditions sensitive to primary care, the five most prevalent diagnoses, in descending order were: bacterial pneumonia (18.7%), urinary tract infection (15.1%), angina (14%), cerebrovascular diseases (11.2%), and heart failure (7.6%).

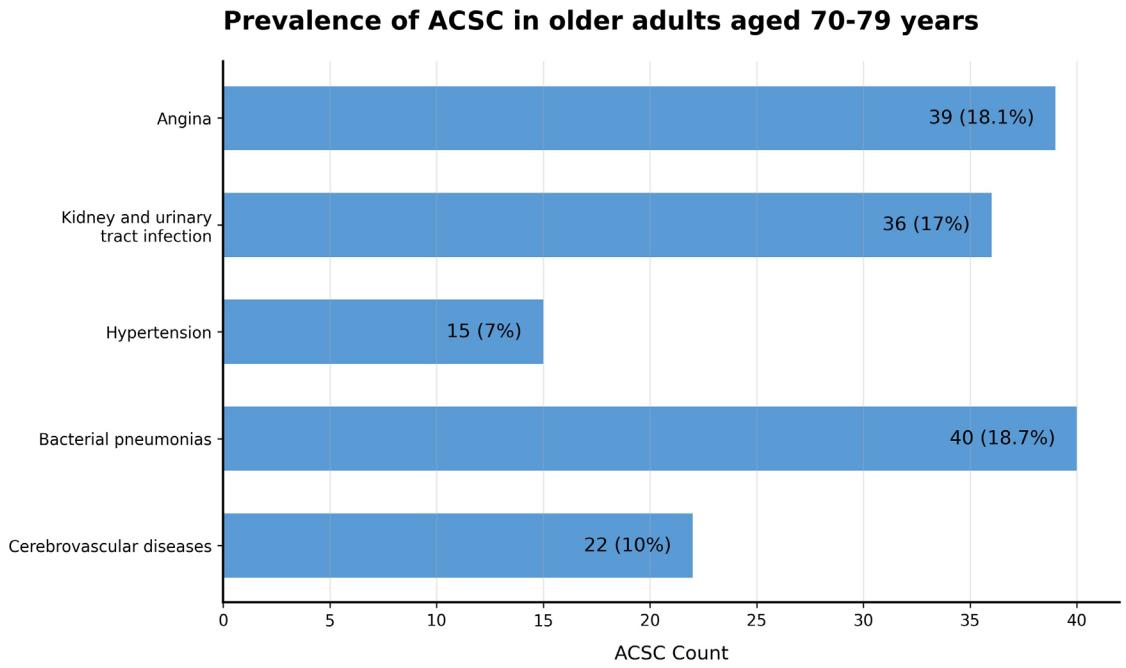

Figure 6. Prevalence of hospitalizations for Ambulatory Care Sensitive Conditions (HACSC) among older adults aged 70-79 years enrolled in the *Usifamília* program in 2019.

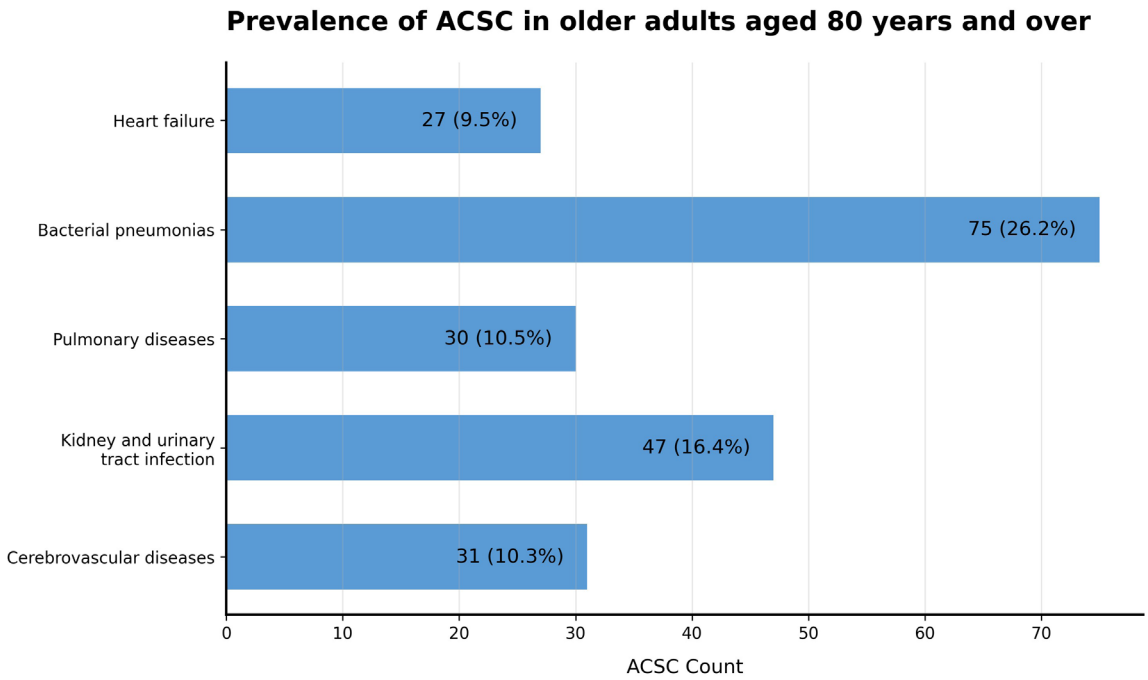

Figure 7. Prevalence of hospitalizations for Ambulatory Care Sensitive Conditions (ACSC) among older adults aged 80 years enrolled in the Usifamília program in 2019.

Among female patients, the distribution in descending order was: bacterial pneumonia (19.4%), urinary tract infection (17.5%), cerebrovascular diseases (11.4%), angina (11%), and heart failure (8%). Among male patients, the distribution was: bacterial pneumonia (17.8%), angina (17.5%), urinary tract infection (12.5%), cerebrovascular diseases (11%), and heart failure (7.1%).

Among patients aged 60 to 69 years, the most prevalent conditions were angina (21.7%), cerebrovascular diseases (12.8%), urinary tract infection (11.8%), hypertension (9%), and bacterial pneumonia (8.5%). In the 70 to 79 age group, the most frequent conditions were bacterial pneumonia (18.7%), angina (18.1%), urinary tract infection (17%), cerebrovascular diseases (10%), and hypertension (7%). Finally, among individuals aged 80 years old or older, the most prevalent conditions were bacterial pneumonia (26.2%), urinary tract infection (16.4%), pulmonary diseases (10.5%), cerebrovascular diseases (10.3%), and heart failure (9.5%).

When analyzed by gender, bacterial pneumonia remained the most prevalent condition in both groups. However, compared with the overall population, a change in the order of prevalence of other conditions was observed, with a higher number of hospitalizations for cerebrovascular diseases than for angina among females and, among males, a higher number of hospitalizations for angina than for urinary tract infections.

When HACSC were stratified by age group, greater variation was observed in the order and predominance of conditions across groups. Among patients aged 60 to 69 years, angina followed by cardiovascular diseases were the most prevalent, and hypertension ranked among the five leading causes of hospitalization. In the 70 to 79 age group, hypertension also appeared among the five most frequent causes. Among individuals aged 80 years old or older, pulmonary diseases emerged as the third most prevalent condition, replacing angina when compared with the overall group. In addition, in both the 70 to 79 age group and the group aged 80 years or older, bacterial pneumonia was the leading cause of hospitalization, following the pattern observed in the overall population.

Another variable analyzed in this study was the relationship between hospitalizations and the population's IVCF. By cross-referencing the available data, it was possible to identify IVCF assessments performed in 2019 for 495 of the 1,838 hospitalized older adults. Among these individuals, 50% were classified as having low vulnerability, 34% as moderate vulnerability, and 16% as high vulnerability.

By analyzing the data collectively and stratifying them by gender, age group, and frequency of hospitalization among older adults, Table 5 was generated:

Table 5. Prevalence of the Clinical-Functional Vulnerability Index (IVCF) by gender, age group, and hospitalization frequency among older adults enrolled in the Usifamília program and hospitalized in 2019.

	Low	Medium	High	Total
Gender				
Female	120 (46)	96 (36.8)	45 (17.2)	261 (100%)
Male	128 (54.7)	70 (29.9)	36 (15.4)	234 (100%)
Age (years)				
60–69	165(66.3)	70 (28.1)	14 (5.6)	249 (100%)
70–79	73(45.6)	64 (40)	23(14.4)	160 (100%)
80 or more	10 (11.6)	32 (37.2)	44 (51.2)	86 (100%)
Hospitalization frequency				
1	210 (56.8)	125 (33.8)	35 (9.4)	370 (100%)
2	34 (41)	27 (32.5)	22 (26.5)	83 (100%)
3 or more	4 (9.5)	14 (33.4)	24 (57.1)	42 (100%)

It was observed that older adults classified as having low vulnerability were predominantly younger and also constituted the main group among those who experienced only one hospitalization in 2019. Approximately half (51.2%) of individuals aged 80 years old or older exhibited high clinical-functional vulnerability, as did 57.1% of those who had three or more hospitalizations during the analyzed period.

DISCUSSION

The high prevalence of hospitalizations among older adults and the predominance of female hospitalized patients are consistent with findings from the National Health Survey conducted by IBGE,[9] which reported higher hospitalization rates among older individuals and women.[9]

A study conducted in Minas Gerais in 2019 reported similar findings regarding the predominance of female patients and observed that this group was more susceptible to hospitalizations. The likelihood of hospitalization was higher among individuals with lower educational attainment, those aged over 60 years, and those who did not regularly use health services, identifying this population as one that requires increased attention.[10] Other national studies have attributed the greater predominance of women to a phenomenon known as the "feminization of aging," which has been associated with women's greater engagement in health-seeking behaviors and self-care, contributing to higher life expectancy.[11]

It is noteworthy that, among very old individuals aged 80 years old or older, a longer length of stay and a higher frequency of hospitalization were observed, indicating the need for closer attention to the specific characteristics of illness in advanced age. One possible explanation relates to functional capacity in this age group. Very old adults may enter a vicious cycle in which loss of functional capacity increases the risk of hospitalization; during hospitalization, functional decline may intensify; and, subsequently, the likelihood of further hospitalizations increases, thereby perpetuating the cycle.[12]

Analysis of the IVCF results yielded findings consistent with this hypothesis. Both the group aged 80 years old or older and the population with three or more hospitalizations had a majority of individuals classified as having high clinical-functional vulnerability, at 51.2 and 57.1%, respectively.

According to national studies, hospital admission is directly and indirectly associated with frailty as assessed by the IVCF. In terms of direct association, older adults aged ≥80 years with a history of hospitalizations and falls were five times more likely to be classified as pre-frail or frail.[13]

Indirectly, recent hospitalizations also negatively affect self-perceived health, which corresponds to the first item assessed in the IVCF. Poor self-rated health among older adults is primarily associated with loss of autonomy and functional decline and, therefore, with greater frailty.[14,15]

Considering that this is a cross-sectional study, providing only a snapshot of the period analyzed, it is not possible to establish a causal relationship; only the prevalence of the categories can be determined. Therefore, it cannot be ascertained whether clinical-functional impairment led to a higher frequency of hospitalizations or whether a higher frequency of hospitalizations resulted in elevated vulnerability scores.

In addition, the Longitudinal Study of the Health of Brazilian Older Adults (*Estudo Longitudinal da Saúde dos Idosos Brasileiros* – ELSI-*Brasil*) identified an association between hospitalization and the presence of chronic diseases, in decreasing order of relevance: stroke, cardiovascular disease, cancer, diabetes, depression, and hypertension.[16] As expected, these highly relevant chronic conditions include diseases associated with increased cardiovascular risk. This finding helps explain why diseases of the circulatory system ranked first as the most prevalent causes of hospitalization, accounting for 19% of all hospitalizations in the present study, and why, among HACSC, they predominated in the group of patients aged 60 to 69 years.

Similar findings have been reported in several studies. Notably, a study conducted in Belo Horizonte/MG, from 2010 to 2019, evaluated the hospitalization profile of older residents and found that diseases of the circulatory system were also the leading cause of hospitalizations, accounting for 22.34% of cases.[11]

Causes related to musculoskeletal, respiratory, and genitourinary diseases exhibited similar prevalence rates, ranging from 11.2 to 9.3%. These figures can be explained by functional changes associated with aging and the epidemiological profile of infections in older adults. Aging leads to a loss of muscle mass and a reduction in the length, elasticity, and number of fibers in tendons and ligaments — changes that are associated with an increased risk of falls and fractures, as well as joint overload and musculoskeletal disorders.[17]

Pulmonary and genitourinary diseases can be attributed to the increased susceptibility of older adults to infections in these systems, as respiratory infections and urinary tract infections are the most commonly observed infections in this population.[18] The prominence of these conditions becomes even more evident when analyzing HACSC, particularly among very old adults, for whom these diseases were the leading causes of hospitalization in this study.

In the present study, HACSC accounted for 27.3% of hospitalizations among all older adults in the analyzed population. Bacterial pneumonia was the leading cause, followed by urinary tract infection, angina, and cerebrovascular diseases.

Among national data, a study evaluating hospitalizations of older adults in Brazil from 2015 to 2019 reported that HACSC accounted for 32.7% of hospitalizations during that period.[19] In a more focused analysis, considering only 2016, 36% of hospitalizations of older adults in Brazil were classified as HACSC, while in 2018, another study reported a prevalence of 34.19%.[20,21]

Regarding the main causes, studies conducted in the states of Paraná, Santa Catarina, Rio Grande do Norte, Goiás, and Minas Gerais also identified bacterial pneumonia and other pulmonary diseases, angina, cerebrovascular diseases, genitourinary tract diseases, and heart failure as leading causes of hospitalization. Although the ranking of these conditions varied across studies, all exhibited substantial prevalence rates.[22-26]

Regarding the rates of HACSC, the values observed in this study were lower than those reported in the literature. It should be noted that published studies typically use data on hospitalizations within SUS, obtained from the Hospital Information System (*Sistema de Informações Hospitalares* – SIH) and made available by the SUS Informatics Department (*Departamento de Informática do SUS* – Datasus). In contrast, Supplementary Primary Care, provided in the private sector, is still limited and lacks specific literature for comparison.

Regarding the private sector, certain limitations in primary care within SUS have been highlighted. Among these, access is considered a major challenge, as inequalities in access hinder the consolidation of PHC as the first point of contact. Loss of access is associated with an increase in HACSC. Furthermore, the Brazilian public health system is described as fragmented, with limited communication between levels of care and services primarily focused on acute conditions or exacerbations of chronic diseases, negatively impacting this indicator.[25]

In traditional supplementary healthcare, there is often a predominance of isolated interventions at the expense of comprehensive care for beneficiaries, with services primarily oriented toward outpatient and hospital care and rarely coordinated or integrated.[27] Consequently, an overload of patients is observed at higher levels of care complexity, alongside a deficiency of services at the primary care level.[28]

A study examining the landscape of primary health care (PHC) in the private sector identified significant challenges in adapting this model of care to the private market.[29] One key factor relates to the investment required to structure and maintain PHC programs, which is still perceived as a high fixed cost. The benefits of such programs typically manifest in the medium to long term, requiring patience from both users and professionals, in addition to extended periods before financial outcomes can demonstrate cost-effectiveness.[27]

In the context of the public sector, supplementary healthcare provides greater availability of resources, such as integrated electronic health records across different levels of care — which improve communication between sectors and ensure coordinated care. Additionally, the use of telehealth services facilitates increased access for beneficiaries, contributing to better health outcomes. It is also possible to structure a skilled and continuously trained workforce through continuing education programs, reinforcing the technical quality of professionals as a key factor in this process.[27,28]

In the context of a progressively aging population and high hospitalization rates among older adults, who are particularly susceptible to frailty and vulnerabilities, the importance of care characterized by accessible, coordinated, longitudinal, and comprehensive services becomes evident. Such care, supported by actions for health promotion, prevention, recovery, and rehabilitation, is facilitated by the implementation of a strong and well-established primary care system.

Thus, although the present study did not examine temporal trends or make comparisons with populations not receiving supplementary primary care, it was observed that individuals under monitoring exhibited lower rates of hospitalizations for conditions sensitive to PHC than those reported in national studies. This finding suggests that primary care, also within the supplementary health system, can be effective in reducing hospitalizations and associated costs, thereby improving health outcomes and quality of life among older adults.

CONCLUSION

Strengthening primary health care within both SUS and the supplementary health care has demonstrated potential to reduce hospitalizations, particularly those associated with ambulatory care-sensitive conditions.

In addition to depicting the reality of supplementary primary care services, for which literature remains limited, this study provides insights into the characteristics and prevalence of hospitalizations among older adults, supporting the design and implementation of targeted care interventions that prioritize needs in an equitable and efficient manner.

The results presented can inform the development of a care pathway focused on the identified needs, risks, and vulnerabilities, as well as the maintenance or implementation of specific instruments such as the IVCF-20. Moreover, by identifying the main causes of hospitalization for the overall population and stratified by age group or gender, the findings can guide the continuing education of the care team toward preventive measures and early interventions targeting these conditions.

Finally, although cross-sectional studies do not permit the determination of causality or the establishment of causal relationships, descriptive studies remain valuable for providing epidemiological and sociodemographic insights into the studied population, guiding the planning of health interventions, and generating findings that can inform hypotheses for future research.

CONFLICT OF INTERESTS

Nothing to declare.

AUTHORS' CONTRIBUTIONS

POR: Conceptualization, Data curation, Formal analysis, Wrinting – original draft, Wrinting – review & editing. LLSOS: Conceptualization, Data curation, Formal analysis, Wrinting – original draft, Wrinting – review & editing. GPSB: Conceptualization, Data curation, Formal analysis, Wrinting – original draft, Wrinting – review & editing.

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