

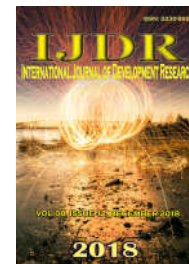


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PREVALENCE AND ASSOCIATED FACTORS WITH OF EMERGENCY SERVICES UTILIZATION BY ELDERLY IN BRAZIL

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ABSTRACT

The emergency room, one of the possibility to access the Brazilian public health system, meets a growing demand of the elderly. This study was aimed to know the prevalence of use and associated factors with the emergency services utilization by the elderly, through population-based research in the five Brazilian geopolitical regions, in one hundred municipalities with different population sizes. Data were collected by electronic questionnaire from August 2008 to April 2009. The sample consisted of 6,624 elderly, predominantly women (59%), mean age 70.9 years and most reported brown, yellow or indigenous population (53.9%). The prevalence of use in was 16.4% in the last year. The use of services was greater for women, unmarried, with less schooling. The occurrence of falls and the medical diagnosis of hypertension and diabetes mellitus increased the probability of using the emergency services. The geopolitical region and population size were statistically associated, observing greater use in the South and Southeast regions and municipalities with 100,001 to 1,000,000 inhabitants. Characteristics of the investigated population indicate the need for improvements in primary health care and support networks. We suggest new studies to complement data about the elderly in the public health system.

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INTRODUCTION

The emergency services provide uninterrupted care to the spontaneous and referenced emergency demands and together with the Basic Health Units are considered one of the possibility to access the Unified Health System (SUS) (Brasil, 2013). The Emergency Care Network brings together components of health promotion, prevention and surveillance, basic health care, emergency mobile service and emergency medical regulation centers, emergency services, emergency care units and home health care (Brasil, 2011). For the organization of the integrated health system, it is essential to consider the demographic and epidemiological profile of the population (Brasil, 2013). For example, the increase in life expectancy requires adjustment of the health system in order to avoid overloading the use of emergency services due to possible aggravations in primary health care (Carret, 2007), mainly due

to the increase in chronic non-communicable conditions, accidents and violence (Lebrão, 2007; Vermelho; Monteiro, 2002). The prevalence of emergency services utilization by the elderly ranged from 15% to 37% in demand studies (Hand *et al.*, 1997; Hu *et al.*, 1999, Chu, Brown and Pillay, 2001; Carret, Fassa, Paniz, Soares, 2011, Marín, Chavez, Carrasco, Bouzon, Manas, 2011, Mokhtar *et al.*, 2014, Thijssen, *et al.*, 2016). The majority of visits were related to non-transmissible chronic morbidities, including systemic arterial hypertension (SAH), diabetes mellitus (DM) and chronic pain (Araújo; Silva, 2012; Serbim; Gonçalves; Paskulin, 2013, Rissardo *et al.*, 2016). Population studies that address the use of emergency services by the elderly are scarce in the literature and it is not possible to identify the utilization profile and its associated factors. Therefore, this study proposes to investigate the prevalence of emergency services use and associated factors in the non-institutionalized elderly population and in private households in an urban area.

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MATERIALS AND METHODS

This is a cross-sectional population-based study, which was conducted in 2009 with elderly individuals, aged 60 years and over, living in urban areas of 100 municipalities in 23 Brazilian states (Acre, Alagoas, Bahia, Ceará, Espírito Santo, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Pará, Paraíba, Paraná, Pernambuco, Piauí, Rio Grande do Norte, Rio Grande do Sul, Rondônia, Santa Catarina, São Paulo, Sergipe and Tocantins) Northeast, North, Southeast and South). For the descriptive study, it would be necessary 4,884 elderly, considering the prevalence of the outcome of 15%, 1% error and 95% CI. This sample would also be adequate to compare differences by sex, age and health problems related to the use of individual health services. Sampling was carried out based on the Brazilian population census of the Brazilian Institute of Geography and Statistics in the year 2000. After the exclusion of the Federal District, the 5,565 municipalities were ordered by population size and the geopolitical regions were selected. The population sample was located in a total of 638 urban census tracts, with an average of 300 households and 0.3 elderly people per household, excluding the rural and special sectors (subnormal clusters, barracks, military bases, camps, boats, ships, indigenous villages, penal colonies, prisons, asylums, orphanages, convents and hospitals). In each census tract, 10 elderly people were interviewed in order to guarantee a better dispersion of the sample, using a domicile every 30 from a systematic jump with a random start.

Data were collected from August 2008 to April 2009, using an electronic questionnaire installed on a standardized and pre-tested Personal Digital Assistant (PDA) containing socioeconomic, demographic and health status variables. The data were stored in portable computers and transferred via the Internet to the coordination of the study. The collection was carried out by 11 teams, composed of four interviewers and one field supervisor, and the quality control was done by supervisors, from a new visit carried out no later than three days after the collection to 5% of the questionnaires completed daily. The descriptive analysis, performed in the Stata12.1 software, included for the categorical variables, percentage calculations and 95% confidence interval. For the quantitative variables, the mean and standard deviation were used. For stratified analysis, we calculated prevalence ratios and 95% confidence intervals.

The outcome was obtained by means of a direct question, with a dichotomous answer (yes or no): Have you been treated in any emergency room since <month> last year so far? The independent variables considered were: sex (male/female), age in complete years (60 to 69 years/70 to 79 years/80 years and over), self-reported skin color (white/black/others - composed of mestizo, yellow (single/married/divorced/widowed), occurrence of drop (yes/no), schooling in full years (none/1 to 4/5 to 8/9 to 11/12 or more) (W / N / NE / SE / S), population size of the municipality (up to 30,000 inhabitants - small municipality/30,001 to 100,000 - average municipality/100,001 to 1,000,000 - large municipality/ > 1,000,000 inhabitants - very large municipality). The present study was approved by the Research Ethics Committee of the Faculty of Medicine of the Federal University of Pelotas, through number 152/07.

RESULTS

The amount of 6,624 elderly people participated in the study. The majority of the elderly were female (59.0%), aged 60-69 years (50.1%) and mean age 70.9 years (\pm 0.98), brown/yellow/indigenous skin color to 53.9% of the sample. More than one-third of the elderly (37.8%) had no year of study and slightly more than half were married (51.2%) (Table 1). Regarding health conditions, almost half of the sample reported having a medical diagnosis of systemic arterial hypertension (SAH) (51.9%), while only 16.9% mentioned having a medical diagnosis of diabetes mellitus (DM). Among the elderly interviewed, 27.6% reported having fallen in the last year. The Southeast region (35.3%) and the large municipalities represented more than a third (39.3%) of the sample studied (Table 1). The prevalence of use of emergency room services was 16.4% (n = 1,084), presenting statistically significant differences for gender, schooling, marital status, morbidity (decrease in the last year, SAH and DM), geographic region and size population (Table 1). The greater use of emergency services was observed among women and in the divorced elderly. Schooling was a protective factor, with greater use among the elderly with 1 to 4 years of schooling compared to those with education of 9 years or more. The occurrence of falls in the last year almost doubled the probability of using the emergency room by the elderly compared to those who did not fall. The diagnosis of SAH and DM increased by 1.5 times the use of those who did not have these morbidities (Table 1).

Differences were also statistically significant for use among the elderly in the Southern region compared to the elderly in the North, and this probability was 2.5 times higher for use. Elderly from municipalities with populations between 100,000 and 1,000,000 inhabitants showed greater use of services when compared to municipalities up to 30,000 inhabitants (Table 1). In municipalities with up to 30,000 inhabitants and those with more than one million inhabitants, it was observed that women used 35.0% to 40.0% more emergency services compared to the male population. When evaluating the use according to the age group, no statistically significant differences were observed in the different population sizes, the highest prevalence of use occurred in the age group from 70 to 79 years (23.5%) in municipalities with a size between 100 thousand and one million inhabitants (Table 2). Skin color showed statistically significant differences only in municipalities with up to 30,000 inhabitants, with a lower prevalence of use by black self-referred individuals. However, as the population size of the municipalities increases, the prevalence of emergency services increases from 7.4% (up to 30,000 inhabitants) to 23.8% in municipalities with more than one million inhabitants (Table 2). Schooling has been shown to influence the use only in municipalities with up to 30,000 inhabitants, with less use in the elderly without any year of schooling and in those who reported 9 years or more of study. Municipalities with a population between 100,000 and one million inhabitants had higher prevalence in use, reaching 24.6% in the elderly with no schooling (Table 2). Married elderly persons used less emergency services compared to single, divorced or widowed, with statistically significant differences in very small municipalities (Table 2). Last fall episode doubled the prevalence of use in virtually all population sizes, except in municipalities between 30,000 and 100,000 inhabitants, where the probability of use was 54.0% higher (Table 2).

Table 1. Sample distribution according to independent variables and prevalence of use of emergency services by the elderly in Brazil. Study Aquareas, UFPel, 2009/2010

	Sample n (%)	Prevalence of use of emergency room	RP	p value IC 95%
<i>Sex</i> (n=6.616)				
Male	2.714 (41,0)	15,3	1	13,2 – 17,6
Female	3.902 (59,0)	17,3	1,13	15,1 – 19,7
<i>Age/years</i> (n=6.601)				
60-69	3.308 (50,1)	15,9	1	13,8 – 18,2
70-79	2.251 (34,1)	17,1	1,07	14,9 – 19,5
80 and more	1.042(15,80)	16,5	1,04	14,4 – 18,9
<i>Color</i> (n=6.456)				0,104
White	2.604 (40,3)	15,3	1	13,2 – 17,6
Black	376 (5,8)	17,1	1,12	14,9 – 19,5
Brown/Yellow/Indigenous	3.476 (53,9)	17,3	1,13	15,0 – 19,7
<i>Schooling/years</i> (n=6.538)				0,050
None	2.470 (37,8)	16,7	1,24	14,6 – 19,1
1 a 4	2.408 (36,8)	17,5	1,30	15,3 – 19,9
5 a 8	851 (13,0)	15,5	1,15	13,4 – 17,8
9 or more	809 (12,4)	13,5	1	11,5 – 15,7
<i>Civil Status</i> (n=6.613)				0,021
Single	685 (10,4)	17,5	1,16	15,3 – 19,9
Married	3.384 (51,2)	15,1	1	13,0 – 17,4
Divorced	483 (7,3)	19,3	1,28	17,0 – 21,8
Widowed	2.061 (31,1)	17,7	1,17	15,5 – 20,1
<i>Falls in the current year</i> (n=6.583)				0,000
No	4.766 (72,4)	13,1	1	11,1 – 15,2
Yes	1.817 (27,6)	25,2	1,92	22,6 – 27,9
<i>SAH*</i> (n=6.580)				0,000
No	3.168 (48,1)	12,8	1	10,9 – 15,0
Yes	3.412 (51,9)	19,9	1,55	17,6 – 22,5
<i>DM**</i> (n=6.582)				0,000
No	5.472 (83,1)	15,2	1	13,1 – 17,5
Yes	1.110 (16,9)	22,9	1,51	20,4 – 25,5
<i>Region</i> (n=6.624)				0,000
North	558 (8,4)	8,7	1	7,1 – 10,5
Northeast	1.514 (22,9)	11,0	1,38	9,2 – 13,0
West	707 (10,7)	16,0	1,84	13,3 – 17,7
Southeast	2.338 (35,3)	20,5	2,36	18,1 – 23,0
South	1.507 (22,7)	22,0	2,53	19,5 – 24,5
<i>Habitants</i> (n=6.624)				0,000
Until 30.000	1.538 (23,2)	10,5 160 (10,5)	1	8,8 - 12,5
30.001 a 100.000	935 (14,1)	14,8	1,41	12,7 – 17,0
100.001 to 1.000.000	2.602 (39,3)	21,6	2,06	19,2 – 24,6
1.000.001 or more	1.549 (23,4)	14,7	1,60	12,6 – 16,9

*systemic arterial hypertension **diabetes mellitus.

Table 2. Prevalence of use of emergency services by the elderly according to the population size of the municipalities, sociodemographic characteristics and morbidities. Study Aquareas, UFPel, 2009/2010

Inhabitants	Upto 30.000 (%)	IC 95%	30.001 to 100.000 (%)	IC 95%	100.001 to 1.000.000 (%)	IC 95%	1.000.001 and more (%)	IC 95%	Total
<i>Sex</i> (n=1.084)									
Male	8,7%	8,4-9,0	13,8%	10,5-17,6	21,6%	19,2-24,2	11,8%	9,3-14,7	15,3%
Female	11,8%	9,7-14,1	15,4%	12,5-18,6	21,6%	19,5-23,8	16,5%	14,2-19,0	17,3%
<i>Age/years</i> (n=1.082)									
60-69	10,2%	8,0-10,6	14,6%	11,5-18,1	20,9%	18,8-23,2	13,3%	10,9-16,0	16,0%
70-79	10,2%	7,8-13,0	15,9%	12,1-20,4	23,5%	20,6-26,5	15,3%	12,4-18,6	17,1%
80 and more	11,7%	8,0-16,2	12,6%	7,5-19,4	20,2%	16,4-24,5	17,9%	13,4-23,2	16,6%
<i>Color</i> (n=1.059)									
White	11,1%	8,7-14,0	13,7%	10,4-17,5	20,3%	17,8-22,9	12,6%	10,2-15,4	15,3%
Black	7,4%	6,1-8,3	16,7%	6,7-31,4	18,4%	13,3-24,5	23,8%	14,0-36,2	17,1%
Brown/yellow/indigenous	10,4%	8,4-12,6	15,0%	11,8-18,6	23,2%	21,0-25,5	16,0%	13,4-18,7	17,3%
<i>Schooling/years</i> (n=1.069)									
None	9,8%	9,7-9,9	12,4%	9,3-16,1	24,6%	21,8-27,6	17,6%	13,8-22,1	16,7%
1 to 4	11,6%	8,8-14,8	17,8%	14,0-22,2	21,3%	18,9-24,0	15,1%	12,2-18,5	17,5%
5 to 8	13,8%	7,9-21,7	13,0%	6,9-21,7	17,3%	13,6-21,6	14,4%	10,5-19,2	15,5%
9 and more	7,1%	6,1- 8,1	14,8%	8,1-23,9	18,5%	13,9-23,8	11,2%	8,2-14,8	13,5%
<i>Civil status</i> (n=1.084)									
Single	8,7%	8,1-9,2	17,7%	10,2-27,4	25,9%	20,8-31,6	12,5%	7,9-18,5	17,5%
Married	9,5%	9,3-9,6	13,5%	10,6-16,8	20,2%	18,1-22,5	13,3%	10,9-15,9	15,1%
Divorced	11,2%	5,7-19,2	20,3%	11,0-32,8	25,7%	20,0-32,1	13,2%	7,4-21,2	19,3%
Widowed	12,5%	9,7-15,7	15,0%	11,0-19,7	21,5%	18,7-24,5	18,2%	14,9-21,9	17,7%

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Fall in the current year (n=1.080)									
No	8,3%	8,1-8,5	12,8%	10,4-15,5	17,1%	15,4-18,9	11,5%	9,7-13,5	13,1%
Yes	16,6%	13,1-20,6	19,8%	14,9-25,3	32,5%	29,2-36,0	23,3%	19,4-27,7	25,2%
SAH(n=1.083)									
No	6,0%	5,7-6,4	12,8%	9,9-16,2	18,0%	15,9-20,3	11,8%	9,6-14,5	12,8%
Yes	15,2%	12,7-18,0	16,7%	13,4-20,4	24,8%	22,6-27,1	17,3%	14,7-20,1	19,9%
DM (n=1.083)									
No	9,2%	9,0-9,3	14,0%	11,6-16,6	19,9%	18,2-21,7	14,2%	12,3-16,2	15,2%
Yes	17,4%	12,7-23,0	19,3%	13,1-26,8	29,2%	25,2-33,4	17,5%	13,0-22,7	22,9%
Region(n=1.084)									
North	6,9%	6,2-7,6	5,7%	4,8-6,6	-	-	11,2%	7,6-15,7	8,7%
Northeast	6,8%	6,4-7,2	10,4%	6,9-14,9	14,8%	11,7-18,4	13,4%	9,5-18,0	11,0%
West	9,7%	8,9-10,0	27,4%	16,9-40,2	22,1%	17,6-27,1	23,2%	18,3-28,8	21,9%
Southeast	13,6%	10,6-17,1	16,1%	11,7-21,4	25,0%	22,7-27,4	13,5%	9,6-18,2	20,5%
South	14,3%	10,5-18,8	19,0%	14,3-24,4	18,2%	14,8-22,0	13,2%	10,3-16,6	16,0%

Elderly patients with a medical diagnosis of hypertension and a very small municipality were 2.5 times more likely to use emergency services, ranging from 30.0% to 46.0% in other population sizes and significant differences, with the exception of 30 and 100 thousand inhabitants. Having a medical diagnosis of diabetes showed a statistically significant association in the use of emergency services in very small municipalities and in those between one hundred thousand and one million inhabitants, with respectively 89.0% and 47.0% higher probability of use (Table 2). The analysis by geopolitical region and population size highlights the lower use of services in the North region, regardless of the population size. In the municipalities with up to 30,000 inhabitants, the greatest use occurred in the Southeast and South regions. The Central-West region had a higher prevalence of use in municipalities between 30,000 and 100,000 and in those with more than one million inhabitants (27.4% and 23.2%, respectively) (Table 2).

DISCUSSION

The prevalence of early-aid use by the elderly was 16.4%, similar to the findings of demand studies conducted in the Americas, in which the elderly represented between 15% and 19% of the users (Handy *et al.*, 1997, Carret, Fassa, Paniz, Soares, 2011, Marín, Chavez, Carrasco, Bouzon and Manas, 2011). The emergency services utilization was lower among elderly married or with partners, indicating the availability of a support network and suggesting that better health care follow-up avoids or minimizes the need for urgent care as in cases of aggravation of chronic problems (Serbim, Gonçalves and Paskulin, 2013). In this study, schooling was not associated to emergency services utilization, although evidence in the literature indicates that people with low schooling and low income are, for the most part, unaware of the importance of maintaining health care and seek less services of health, when compared to those with higher schooling and higher income (Dias da Costa, Gigante, Horta, Barros and Victora, 2008). When stratified by population size, schooling showed association only in municipalities with less than 30,000 inhabitants, with less use among the elderly with nine or more years of schooling. The occurrence of falls doubled the probability of using the emergency services. The rates of falls have been shown to be high in people aged 65 years or over (38.6%), especially in women (79.7%), which corroborates with the findings described (Morales *et al.*, 2017; Perracini, Ramos, 2002). The falls of the same height, among the traumas, accounted for 80.0% of the occurrences in the elderly

attended at an Emergency Unit of a teaching hospital, followed by runners (9.0%) (Lima, Campos, 2011). Studies in the elderly and users of emergency services have identified that most of them presented chronic non-communicable morbidities, such as systemic arterial hypertension (SAH), diabetes mellitus (Araújo, Silva, 2012, Serbim; Gonçalves, Paskulin, 2013, Rissardo *et al.*, 2016), and problems related to the circulatory system (Carret, Fassa, Paniz, Soares *et al.*, 2011), which corroborate with the findings of this study. For the elderly with a diagnosis of DM, the probability of use was 1.5 times higher when compared to those without diagnosis. Non-communicable chronic diseases lead the search for emergency care and, in Brazil, they were responsible for approximately 72.6% of deaths in the year 2013, reflecting the change in disease burden and a new challenge for health managers (Brazil, 2014). Inequalities in access and utilization of services have a strong association with the geographic region and the characteristics of municipalities, since in poorer regions there is a greater precariousness in the infrastructure and availability of physical and material resources (Travassos, Oliveira and Viacava, 2006). In Brazil, the distribution of emergency services can be characterized as an access barrier as long as distances and concentration of health services are observed in the South, Southeast and coastal regions of the Northeast (Rocha *et al.*, 2017). These findings reinforce this assertion with a greater probability of use by the elderly in the South and Southeast regions, when compared to those in the North. More than two-thirds of the emergency services (n = 321) are located in the Southeast (n = 263) and South (n = 58) regions (Brazil, 2017). One of the Health Ministry of health strategies to reorganize, qualify and strengthen this Emergency Care Network in the Unified Health System was the institution of Emergency Care Units (ECU), with characteristics for the resolution of acute and/or chronic acute patients, first emergency services with a view to stabilizing the situation and assessing the need for hospitalization (Brazil, 2017). Alves and Silveira (2014) identified in a qualitative study, overcrowding, exclusion at the entrance door, disrespect for users' rights, and poor articulation with other network services as challenges to be overcome by emergency services. Characteristics identified in the studied population indicate the need for investments in care for chronic health conditions and improvements related to the support network of the elderly. The investigation of emergency services utilization with based a population survey is a strengths compared with demand the studies. We suggest new investigations about the therapeutic itinerary used by the elderly in the health services network, with emphasis on the forms of access, the legal nature of care, the form of travel used to reach the service and the costs of care and

transportation, besides the referrals made, changes in health status and satisfaction with the care received.

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