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Demographic and socioeconomic analysis of medication use by elderly people living in rural areas

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Abstract

The objective of this study is to analyze the association of demographic and socioeconomic characteristics related to medication use. A sample of 822 elderly people aged 60 years or older was evaluated. Data collection took place from July to October 2014. Evidence of associations between sex and medication use and age group and medication use was obtained. The prevalence regarding the use of at least one medication was 83%. Medications for the cardiovascular system were the most prevalent, followed by the dietary tract, and metabolism and nervous system. The large amount of drugs used for Chronic Non-Communicable Diseases stands out, thus, the importance of comprehensive health care for the elderly is highlighted.

Keywords: Pharmacoepidemiology. Health of the rural population. Elderly health. Cross-sectional studies. Chronic disease.

INTRODUCTION

The increase in life expectancy and, consequently, in the proportion of elderly people has caused important changes in the general morbidity profile. During aging, a set of physiological, morphological, and psychological changes can occur, which progressively modify the organism, and is considered a process that can affect the independence and autonomy of the elderly individual. The main diseases related to aging are classified as Chronic Non-Communicable Diseases (CNCDs)[1].

CNCDs are all those with a slow progression and long duration. This category includes cardiovascular, metabolic, respiratory, and cancer diseases. Therefore, the elderly individual may have multiple morbidities and generally, in most cases, need to use many medications[2]. In this case, in order to have an effective control of the disease, it is necessary for the patient to adhere to drug treatment and change in lifestyle[3]; thus, comprehensive health care for the elderly becomes important.

Comprehensive health care for the elderly is ensured by the Ministry of Health, through the Unified Health System (UHS), a model within Primary Health Care that created the Family Health Strategy (FHS), with the aim of serving all UHS users, as well as the elderly. The purpose of the FHS is to assist the individual in their family nucleus, within their reality

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from the environment in which they live, facilitating the understanding of the health-disease process, while promote interventions that include access and rational use of medicines[4].

In the context of the health of the elderly, medication is an important instrument for maintaining and recovering health[5], but the use of multiple medications by the elderly can predispose them to drug interactions and adverse drug events.

Studies on the use of medication rarely include data related to elderly people living in rural areas, probably due to logistical limitations, such as difficult access, especially long distances, as well as the difficulty related to the financial resources needed to move the teams[6].

In this context, the objective of this study was to analyze the association of demographic and socioeconomic characteristics related to medication use. Therefore, the prevalence of medication use among elderly people in rural Pelotas, Rio Grande do Sul, Brazil was analyzed.

METHODS

This is a part of the study called "Prevalence and factors associated with frailty syndrome in the elderly population" possessing a quantitative approach with a cross-sectional and analytical design. It had a sample corresponding to 822 participants. A survey of all elderly residents registered in the Primary care centers (PCC)-FHS in the rural area was carried out. Subsequently, the number of elderly people needed for each PCC was calculated, in order to make the sample representative. Finally, a draw was carried out for the elderly from each PCC. Elderly people of both sexes who live in the rural area of Pelotas participated in the study. The inclusion criteria were those who were 60 years of age or older, residing in the rural area of Pelotas in the territory covered by the FHS. Individuals who, at the time of the interview, were deprived of their liberty by court decision, residing in Long-term care institutions and/or hospitalized were excluded.

Data collection took place from July to October 2014. In the rural area of the municipality of Pelotas, in 2014, 12 Primary Care Centers (PCC) were located, of which only two did not have an FHS. During data collection, an instruction manual was made available to the interviewers regarding each question in the instrument, which was a standardized, structured, and pre-coded questionnaire. After training the interviewers, a pilot test was carried out with ten elderly people living in rural Pelotas who were not part of the sample for data collection.

In this study, issues related to the socioeconomic and demographic characteristics of the elderly and the use of medication were analyzed. The data were organized in spreadsheets in the Microsoft Excel® application. All drugs were classified according to the first level of the Anatomical Therapeutic Chemical Classification System (ATC)[7]. An exploratory descriptive analysis was performed. The variables were analyzed in terms of absolute and relative frequencies [n, %]. For all analyses, a significance level of 5% and a confidence level of 95% were adopted. The analyses were performed in R version 4.0.2[8].

The research project was approved by the Research Ethics Committee of the School of Nursing of the Federal University of

Pelotas with identification number CAAE 29256214.1.0000.53.16 and opinion number 649.802, of May 19, 2014. In addition, it met all the specifications of the Resolutions 466/2012 - 510/2016 - 580/2018, from the Ministry of Health.

RESULTS

A total of 822 participants were considered eligible, of whom 681 (83%) reported using at least one medication. The maximum number of medications used was 18 per elderly person.

Women represented 55.7% of the sample. It was also observed that women used more medications (87.7%) than men (77.4%). A p-value < 0.001 indicates that there is evidence of an association between sex and medication use. Approximately 50.5% of the elderly were between 60 and 69 years of age. The p-value <0.001 demonstrates that there is evidence of an association between age and medication use (Table 1).

Table 1 - Demographic and socioeconomic characteristics and use of medication by elderly people in rural areas. Pelotas, Brazil, 2014.

		Did you use at least one medication?		
Variable	**n (%)**	**Yes**	**No**	**P value**
Age group				
60 to 69	415 (50.5%)	324 (78.1%)	91 (21.9%)	
70 to 79	287 (34.9%)	252 (87.8%)	35 (12.2%)	< 0.001
80 to 89	103 (12.5%)	93 (90.3%)	10 (9.7%)	
90 or more	14 (1.7%)	12 (85.7%)	2 (14.3%)	
Ignored	3 (0.4%)			
Sex				
Female	457 (55.6%)	401 (87.7%)	56 (12.3%)	< 0.001
Male	363 (44.2%)	281 (77.4%)	82 (22.6%)	
Ignored	2 (0.2%)			
Skin color				
Yellow	11 (1.4%)	10 (90%)	1 (10%)	
White	740 (90%)	617 (83.4%)	123 (16.6%)	0.687
Brown	50 (6.1%)	25 (78%)	7 (22%)	
Black	19 (2.3%)	15 (84.2%)	4 (15.8%)	
Ignored	2 (0.2%)			
Education				
No study	117 (14.2%)	93 (79.5%)	24 (20.5%)	
1 year	52 (6.4%)	47 (92.2%)	4 (7.8%)	
2 years	68 (8.3%)	54 (79.4%)	14 (20.6%)	
3 years	153 (18.6%)	131 (85.6%)	22 (14.4%)	0.213
4 years	182 (22.1%)	153 (84.1%)	29 (15.9%)	
5 years	181 (22%)	145 (80.1%)	36 (19.9%)	
6 or more	64 (7.8%)	57 (89.1%)	7 (10.9%)	
Ignored	5 (0.6%)			
Income (in minimum wages*)				
Less than 1	13 (1.6%)	13 (100%)		
1	476 (57.9%)	396 (83.2%)	80 (16.8%)	
2	182 (22.1%)	151 (83%)	31 (17%)	0.466
3	108 (13.1%)	87 (80.6%)	21 (19.4%)	
4 or more	39 (4.8%)	34 (87.2%)	5 (12.8%)	
Ignored	4 (0.5%)			

*considering the value of the minimum wage in 2014: R$ 724.00.

As for income, 57.9% reported receiving around one minimum monthly wage. The p-value = 0.466 indicates that there is no evidence of an association between the grouped salary and the use of medication. Regarding education, 117 participants (14.2%) reported having no years of study, 636 (77.4%) between one and five years of study, and 64 (7.8%) with 6 or more years of study. The p-value = 0.213 showed that there is no evidence of an association between schooling and medication use. White skin color was reported by 90% of study participants. The p-value was 0.687, so there is no evidence of association between skin color and medication use.

In total, 2,581 drugs were referred, of which 286 were different drugs. The group of drugs for the cardiovascular system corresponded to 47.9%, and hydrochlorothiazide was used by 209 elderly people, representing 25.43% of the total sample. The second group with the highest number of drugs used was for the dietary tract and metabolism (17.7%) (Table 2).

The five drugs most frequently used by the elderly were hydrochlorothiazide (25.43%), simvastatin (17.03%), losartan potassium (16.67%), acetylsalicylic acid (16.06%), and omeprazole (14.96%).

Table 2 - Classification of medications used by the elderly, according to ATC* level 1. Pelotas, Brazil, 2014.

ATC Classification Level 1	n (%)
C- Cardiovascular System	1,236 (47.9%)
A- Alimentary tract and metabolism	458 (17.7%)
N- Nervous System	435 (16.8%)
B- Blood and Hematopoietic Organs	190 (7.4%)
M- Musculoskeletal System	115 (4.5%)
H- Systemic Hormones, except sex hormones and insulin	54 (2.1%)
R- Respiratory System	32 (1.2%)
G- Genitourinary system and sex hormones	28 (1.1%)
L- Antineoplastics and Immunomodulators	13 (0.5%)
J- General anti-infectives for systemic use	9 (0.4%)
S- Sensory Organs	8 (0.3%)
D- Dermatological	3 (0.1%)

*ATC: Anatomical Therapeutic Chemical Classification System.

DISCUSSION

The findings regarding gender and age group found in the present study are similar to the results of a survey carried out in 2018 in the rural area of the municipalities of Arcos, Piumhi, Pimenta, and Japaraiba, located in the center-west of Minas Gerais, with a predominance of female elderly people and those aged between 60-69 years old[9].

The higher prevalence of women and the higher consumption of medication by them can be explained by factors such as greater concern with health, having a greater perception of the signs and symptoms of diseases and, therefore, seeking more health services, which can colla-

borate to greater use of medications[10].

The level of education found in this study indicates that less than 7.8% of the elderly have completed elementary school. The low level of education can lead to difficulties for the population in reading and interpreting information about medications, with the risk of incorrect use and potential harm[1-11].

The economic profile of the elderly interviewed showed a monthly income of one minimum wage. Income represents a determining factor in the health situation, since at this stage of life there is a greater need for medicines, health services, and other costs that the process of physical limitation entails, which compromises approximately a quarter of the average monthly income of more than half of the elderly population[12-13].

The prevalence found regarding the use of medication (83%) was similar in a study carried out in the rural area of Pelotas, RS in 2016 (81.9%)[10], but higher than in the study carried out in the rural area of the Municipality of Carlos Barbosa, RS in 2004 (63.5%)[6] and lower than a study carried out in the rural area of Paraíso, SC in 2013 (87.8%)[14].

The order of prevalence of the most frequently used drugs were those acting on the cardiovascular system, dietary tract/metabolism, and nervous system, a result that corroborates other studies[15-16]. The group of medications for the cardiovascular system were also the most used by the elderly in a rural municipality in the state of Rio Grande do Sul, Brazil6, in an urban area in Brazil[17-18], and in a study carried out in France[19].

The most prevalent drug hydrochlorothiazide in the study was also the most used in a study carried out with elderly people living in the urban area of the city of Cuiaba, MT in 2012[15].

Hydrochlorothiazide belongs to the class of substances that have diuretic action, generally intended for the treatment of arterial hypertension, widely used as initial monotherapy as well as in the treatment of edema associated with other comorbidities. It is a drug that has more evidence of effectiveness in relation to cardiovascular outcomes, with clear benefits for all types of events[20-21].

Simvastatin, the second most mentioned drug in this study, reduces the levels of bad cholesterol (LDL cholesterol) and fatty substances called triglycerides, and increases the levels of good cholesterol (HDL cholesterol) in the blood. Simvastatin is a drug that should be used with caution by the elderly because it can cause myopathy/rhabdomyolysis depending on the dosage and other drugs in use[20].

Losartan potassium works by dilating blood vessels to help the heart pump blood around the body more easily. This action helps to reduce high blood pressure, it also reduces the risk of heart and blood vessel diseases, such as stroke in patients with high blood pressure and thickening of the walls of the left ventricle of the heart[20].

Acetylsalicylic acid (ASA) has analgesic, antipyretic, anti-inflammatory effects and is also an antiplatelet agent[20]. In this study, it is believed that in most cases it was used to prevent the formation of clots in blood vessels, thus, preventing certain cardiovascular diseases. Acetylsalicylic acid (ASA), which is often prescribed to the elderly, requires care as it may interact with different drug classes, including beta-blockers[22].

Omeprazole is indicated to treat certain conditions where there is too much acid production in the stomach. It is used to treat gastric and duodenal ulcers, and gastroesophageal reflux. It is also used to treat dyspepsia, a condition that causes acidity, heartburn, belching, or indigestion[20]. It should be noted that omeprazole was the fifth most frequent drug among the elderly, it has a greater potential for drug interactions of drugs commonly used

by the elderly, such as acetylsalicylic acid, glibenclamide, and nifedipine[15].

In the group of drugs that belong to the nervous system are benzodiazepines (clonazepam, diazepam, alprazolam, bromazepam, lorazepam, cloxazolam) and their use by the elderly drew attention because they are potentially inappropriate drugs for the elderly as they act directly on the central nervous system, altering cognitive and psychomotor aspects in the body. Their main therapeutic effects are sedation, hypnosis, and muscle relaxation. Prolonged use of benzodiazepines, even at low doses, is a risk factor for the development of adverse effects that can manifest as drowsiness, dizziness, tiredness, mental confusion, headache, anxiety, lethargy, ataxia, postural hypotension, retrograde amnesia, accidents, tolerance, dependence, and increased frequency of falls[21]. A drug is considered inappropriate when the risk of its use outweighs the benefit[23], as these are drugs with a high risk of adverse drug-related reactions, without sufficient evidence of benefits and because there are safer therapeutic alternatives[24].

The low prevalence of drugs that act on the respiratory system and anti-infectives can be explained by the fact that the elderly in rural areas may have used teas and home remedies; however, these were not evaluated in this study, possible being a future study, which can be cited as a limitation of the study. Other factors that could also be the reason for the low prevalence of such drugs may be the difficulty of accessing them, for example, due to shortages. On the other hand, this low prevalence in the use of such drugs may be related to a lower occurrence of infections.

Another limitation is that the drug dosage used by each elderly person was not collected, making it impossible to analyze potential adverse drug-related reactions.

CONCLUSION

Based on the results, it was found that there is a high prevalence of medication use among elderly people living in rural areas, among them, those used for CNCDs stand out. In addition, a higher consumption of medication by women was found, and the statistical analysis showed an association between sex and the use of medicines, as well as evidence of an association between age and the use of medicines. Thus, this study is relevant as it can be used as comparison data for future studies.

Author statement CRediT

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