

# The characterization of elderly medication users living in long-term care facilities\*

CARACTERIZAÇÃO DOS IDOSOS USUÁRIOS DE MEDICAÇÃO RESIDENTES EM INSTITUIÇÃO DE LONGA PERMANÊNCIA

CARACTERIZACIÓN DE ANCIANOS USUARIOS DE MEDICACIÓN RESIDENTES EN HOGAR GERIÁTRICO

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## ABSTRACT

The objectives of this study were to characterize the elderly living in a long-term care facility in terms of their medication use and verify the existence of polypharmacy. This descriptive quantitative study was performed using a database from the research: *The profile of the elderly living in a long-term care institution for the aged: a proposal for nursing/health action*. A total of 39 elderly individuals who used medications were selected. It was found that most were women, aged between 80-89 years, who were literate and widowed. Circulatory system diseases were the most frequent. The elderly used a mean of 3.7 medications, and 30.8% took multiple medications. The most commonly used medications were for the cardiovascular system. It was found that some individuals used medications considered inappropriate for the elderly population. We hope to sensitize health professionals to promote a rational and careful use of medications among institutionalized elderly individuals.

## DESCRIPTORS

Aged  
Homes for the Aged  
Drug utilization  
Geriatric nursing

## RESUMO

Os objetivos deste estudo foram caracterizar os idosos residentes em uma Instituição de Longa Permanência quanto ao uso de medicamentos e verificar a existência de polifarmácia. Trata-se de estudo descritivo e quantitativo, realizado por meio de dados de um banco originado da pesquisa *Perfil de idosos residentes numa Instituição de Longa Permanência para Idosos (ILPI): proposta de ação de enfermagem/saúde*. Foram selecionados 39 idosos que faziam uso de medicação. Os achados evidenciaram predominância de mulheres, com idade entre 80 e 89 anos, que sabem ler e são viúvas. As doenças do aparelho circulatório foram as mais frequentes. Os idosos usavam em média 3,7 medicamentos e 30,8% deles utilizavam polifarmácia. Os medicamentos mais usados foram para as intercorrências do sistema cardiovascular. Verificou-se a presença de medicamentos considerados impróprios para idosos. Espera-se sensibilizar os profissionais de saúde a promoverem o uso racional e cuidadoso de medicamentos para os idosos institucionalizados.

## DESCRITORES

Idoso  
Instituição de longa permanência para idosos  
Uso de medicamentos  
Enfermagem geriátrica

## RESUMEN

El estudio objetivó caracterizar a los ancianos residentes en un hogar geriátrico respecto del uso de medicamentos y verificar la existencia de polifarmacia. Estudio descriptivo, cuantitativo, utilizando banco de datos recopilados para la investigación *Perfil de ancianos residentes en una residencia geriátrica (ILPI): propuesta de acción de enfermería/salud*. Fueron seleccionados 39 ancianos usuarios de medicación. Los hallazgos evidencian predominancia de mujeres con edad entre 80-89 años, alfabetizadas y viudas. Las enfermedades del aparato circulatorio fueron las más frecuentes. Los ancianos utilizaban en promedio 3,7 medicamentos, 30,8% de ellos era usuario de polifarmacia. Los medicamentos de mayor utilización fueron aquellos para las complicaciones del sistema cardiovascular. Se verificó la presencia de medicamentos considerados impropiedades para ancianos. Se espera sensibilizar a los profesionales de salud para promover el uso racional y cuidadoso de medicamentos para los ancianos institucionalizados.

## DESCRIPTORES

Anciano  
Hogares para Ancianos  
Utilización de medicamentos  
Enfermería geriátrica

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## INTRODUCTION

Population aging is a current worldwide phenomenon. This means a more elevated increase in the elderly population compared to other age groups<sup>(1)</sup>. In Brazil, population aging is a reflex of the age expectation increase due to advancements in the health field and the reduction in the birth rate; in addition, it is followed by changes in family structures and roles and in work patterns and immigration<sup>(2-3)</sup>.

Along with changes in the age structure of the population, epidemiologic changes are observed, with a change of the main causes of death, from acute parasitic diseases to chronic non-communicable non-communicable diseases (CNCD)<sup>(4)</sup>. These diseases can become long term issues and require, for a suitable care, a great amount of material and human resources. The high prevalence of chronic non-communicable diseases makes elderly people great medication consumers.

For the elderly, the risks involved in consuming medication are higher when compared to the rest of the population due to the fact that they present different responses to medication compared to younger people. This situation emerges from pharmacokinetic and pharmacodynamic alterations that are particular to the aging process, making this population more vulnerable to medication interactions, side effects and adverse medication reactions<sup>(5)</sup>.

Another factor that may increase the risks of medication use is non-adherence to the therapeutic regime, due to cognitive and functional deficit that may hinder one's ability to recognize and memorize the information involved. Also, self-medication and the inappropriate indication by the health care professional are also reported, as in cases of complex therapeutic regime prescriptions, non justified polypharmacotherapy, among others<sup>(4,6-7)</sup>.

The consumption of multiple medications, among the elderly, although needed in many occasions, when inappropriate, may trigger serious complications, often leading to polypharmacy, which is characterized by the simultaneous use of five or more medications<sup>(8-9)</sup>. Some authors also define polypharmacy as the use of more medications than what is clinically indicated<sup>(6-8)</sup>. Moreover, problems related to medications may emerge as negative clinical results, derived from pharmacotherapy and produced by many different causes that lead to the impossibility of reaching therapeutic objectives or the emergence of unwanted effects<sup>(10)</sup>.

The number of medications is the main risk factor for iatrogenesis and the adverse reactions. There is an exponential relationship between polypharmacy and the probability for adverse reactions, medication interactions and the use of inappropriate medications among the elderly<sup>(11)</sup>.

Some factors have been correlated to polypharmacy, with a view to identifying the more susceptible group to iatrogenesis, as for example, age, functionality and the presence of chronic non-communicable diseases<sup>(12)</sup>.

Older people, living in long-term care institutions would, therefore, be at a higher risk, since they present more limiting diseases, and a tendency for frailness and low functionality. The main factors associated with polypharmacy in institutionalized people include dementia, the number of diagnoses and time of institutionalization. Among the elderly living in the community, age and gender are the main factors related to the use of multiple medications<sup>(13)</sup>.

Studies show that the proportion of elderly people living in long-term care institutions, in advanced demographic transition countries reaches 11.0%, while in Brazil, it reaches 1.5%<sup>(14)</sup>. There is a trend for a demand increase in Brazil, although policies prioritize the family as being assigned to take care of the elderly. Demographic, social and health factors are composed of causes that tend to lead the elderly to live in long-term care facilities. Among other reasons, the female participation in the working market is believed to take away from home the person who traditionally assumes the care of parents and in-laws. Changes in marital status and new family arrangements reduce the perspective of aging amongst the family environment<sup>(15)</sup>.

Many studies have researched the use of medications and polypharmacy in community and hospitalized elderly<sup>(4-5,12-13)</sup>. On the other hand, there is a lack of studies that demonstrate the use of medications in the institutionalized elderly population, as a way to explore risk factors and promote the means for interventions to prevent polypharmacy.

The objective of the present study was to characterize the elderly living in long-term care institutions regarding their use of medications and the existence of polypharmacy.

## METHOD

This descriptive study was performed using a quantitative approach and secondary data from a database from the research named: *Perfil de idosos residentes numa Instituição de Longa Permanência para Idosos: proposta de ação de enfermagem/saúde*, (The profile of the elderly living in a long-term care institution: a health/nursing intervention proposal, developed by for the Study and Research Group on Geronto-geriatrics, Nursing/Health and Education (*Grupo de Estudo e Pesquisa em Gerontogeriatrics, Enfermagem/Saúde e Educação* - GEP-GERON).

The database was composed of the information collected through the Multidimensional Elderly Evaluation

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form, applied to 53 residents of a long-term care institution located in Rio Grande do Sul, Brazil.

The referred long-term care institution was home to 80 elderly individuals, 53 of which took part in this study. The inclusion criteria for the elderly were: 60 years of age or older, being cognitively able to answer the instrument, and be willing to take part in the study. Fifteen elderly individuals did not participate in the study because they presented cognitive issues and were not able to answer the instrument, ten refused to answer the evaluation instrument and two were younger than 60 years old.

A note guide was created to collect any data of interest from the database. This guide was composed of: gender, age, marital status and education level – literate or not; signs and symptoms, as defining characteristics; diseases; medication prescription. From the total, 39 elderly individuals were selected, only those who used medication.

Diseases were grouped according to the International Classification of Diseases (ICD-10)<sup>(16)</sup>. Medications were classified according to the *Anatomical Therapeutic Chemical Code* (ATCC), adopted by the World Health Organization<sup>(17)</sup>. In this classification, they are divided according to the anatomic group or the system in which they act and its chemical, therapeutic and pharmacologic properties. The substances were identified based on their commercial names according to the Brazilian Dictionary of Pharmaceutical Specialties (*Dicionário de Especialidades Farmacêutica- DEF*) (2010/2011)<sup>(18)</sup>. Polypharmacy was considered as the simultaneous use of five or more medications<sup>(9)</sup> for a minimum of one week.

The research that originated the database used in this study was authorized by the president of the long-term care institution for the elderly and was approved by the Research and Ethics Committee in the local health area under number 42/2005.

Data were tabulated and processed in an electronic database in the Microsoft<sup>®</sup> Excel 97 software (Windows XP OS, Microsoft Corporation, Inc.), subjected to descriptive statistics and then presented as tables, under a simple percentage frequency, followed by a descriptive and comparative analysis with other studies performed in other cities and regions.

## RESULTS

Table 1 shows that 29 (74.4%) interviewees were female and there was a predominance of elderly within the age bracket of 80 and 89 years, corresponding to 17 (43.6%). Regarding their marital status, 22 (56.3%) were widowed and 12 (30.8%) were single. Regarding literacy, 29 (74.4%) answered they could read.

**Table 1** – Elderly interviewees according to their social-demographic characterization – Rio Grande do Sul, Brazil, 2011

Social -demographic variables	N	%
<b>Gender</b>		
Female	29	74.4
Male	10	25.6
<b>Age Bracket (years)</b>		
60-69	7	17.9
70-79	12	30.8
80-89	17	43.6
>=90	3	7.7
<b>Marital Status</b>		
Widowed	22	56.3
Divorced	1	2.6
Single	12	30.8
Married	1	2.6
Not informed	3	7.7
<b>Literate</b>		
Yes	29	74.4
No	10	25.6
<b>Total</b>	<b>39</b>	<b>100.0</b>

Table 2 lists the medical diagnoses mentioned by the elderly, grouped according to the International Classification of Diseases (ICD-10)<sup>(16)</sup>. Of all 39 subjects, four presented no diagnosis. The remaining 35 mentioned 16 medical diagnoses, with an average of 2.1 diagnosis/elderly and the most mentioned diseases were those related to the cardiovascular system: 35 (89.7%); followed by endocrine, nutritional and metabolic diseases in 13 (33.3%), and osteomuscular system and conjunctive tissue diseases in 11 (28.2%).

**Table 2** – Distribution of medical diagnoses mentioned by the elderly interviewees, grouped according to the International Classification of Diseases (ICD-10) - Rio Grande do Sul, Brazil, 2011

Diagnoses	N	%
Cardiovascular system diseases	35	89.7
Metabolic, endocrine and nutritional diseases	13	33.3
Osteomuscular and conjunctive tissue diseases	11	28.2
Mental and behavioral disorders	6	15.4
Eye and eye-related diseases	1	2.6
Genitourinary system diseases	1	2.6
Respiratory system diseases	1	2.6
Nervous system diseases	1	2.6
Others	1	2.6
<b>Total</b>	<b>70</b>	<b>100.0</b>

The total number of medications used by the elderly was 143. The elderly population in this study used an average of 3.7 medications/elderly. Regarding polypharmacy, 12 (30.8%) used five or more medications. Table 3 presents the distribution of the elderly subjects according to the number of medication they used.

**Table 3** – Distribution of the elderly subjects according to the number of medication they used - Rio Grande do Sul, Brazil, 2011

Number of medications	N	%
1	4	10.3
2	7	17.9
3	9	23.1
4	7	17.9
5	6	15.4
6	3	7.7
7	2	5.1
8	1	2.6
<b>Total</b>	<b>39</b>	<b>100.0</b>

Among medications used by the subjects, some did not have sufficient information in literature for their identification and/or classification. Table 4 lists as examples personalized formulas, phytotherapy medication as the Nut of India and Ginkgo Biloba, in addition to some commercial names included in *others*.

The medications most used by the elderly were those for the cardiovascular system, in a frequency of 50 (35.0%), mainly anti-hypertensive drugs 24 (16.8%); diuretics 13(9.1%); antianginal drugs 7 (4.9%). Medications related to the central nervous system, corresponded to 25 (17.5%) of the medications used. Medications for the digestive system and for the metabolism represent 15 (10.5%) and antiplatelet agents for the hematopoietic system, 13 (9.1%) of the total. Phytotherapy medications were used by eight elderly subjects, corresponding to 5.6% of the total.

**Table 4** – Medication classes, by anatomic group, prescribed in the medical files of the 39 elderly subjects living in a long-term care institution - Rio Grande do Sul, Brazil, 2011

Classification	N	%
Cardiovascular system	50	35.0
Central nervous system	25	17.5
Metabolism and digestive system	15	10.5
Haematopoietic system	13	9.1
Systemic use	7	4.9
Respiratory system	2	1.4
Bones system	1	0.7
Phytotherapy	8	5.6
Others	22	15.3
<b>Total</b>	<b>143</b>	<b>100.0</b>

## DISCUSSION

Regarding the gender of the present study subjects, data confirm there were more females: 29, accounting for 74.4% of the study population, which agrees with other studies<sup>(4,6,12)</sup>. Women's higher longevity compared to men has been attributed to lower exposure to certain work risk factors, lower tobacco and alcohol consumption rates; differences in attitudes regarding diseases and incapability, and higher gynecology-obstetrics care coverage<sup>(14)</sup>.

The higher number of women living at the long-term care institution in this study may be explained by the fact that they comprise the main parcel of the elderly population. Another possible explanation would be the fact that women are the main informal care providers, but they might not have caretakers for themselves. In the present study, 22 (56.3%) elderly were widowers and 12 (30.8%) were single. In general, women become the caretakers of their parents and also of their husbands if they are married. When they become widows, they do not usually get married again, as opposed to men, who usually do. Therefore, when they are exposed to the typical frailness of aging, and their children do not take responsibility for their care, or when they are childless, being institutionalized is maybe the only alternative for these elderly ladies<sup>(15)</sup>.

There was a predominance of elderly of ages between 80 and 89 years, corresponding to 17 (43.6%) of the total. This population subgroup represented, in 2010, approximately 14.0% of the elderly population and 1.5% of the Brazilian population. Population projections point to a peak in the older population (80 years or more) growth for the next decades. It is estimated that by 2040, this very elderly populations will correspond to one fourth of the elderly population and around 7.0% of the total population, representing 13.7 million elderly persons.

Studies have demonstrated that gender (females) and age (advanced age) are the most consistent social-demographic characteristics associated to medication consumption<sup>(6,8,12)</sup>. The explanation for this positive association between age and higher medication consumption resides in higher occurrences of health problems in more advanced ages, generally long lasting and with higher severity degree, in which treatment and symptoms relief demand pharmacology therapy<sup>(6,15)</sup>.

Most elderly in this study, 29 (74.4%), affirmed being literate, however their education level was not inquired. A study performed in São Paulo, with elderly subjects living in the community, demonstrated that two thirds, accounting for 68.1%, were illiterate or had an incomplete primary education level<sup>(4)</sup>.

The elderly in this study presented an average of 2.1 referred medical diagnoses, demonstrating the need for a closer attention from caretakers in the long-term care institution, as the association between pathologies may increase the number of daily used medications. As in other studies, blood system diseases were the most mentioned by interviewees followed by endocrine, nutritional and metabolic diseases, in addition to the osteomuscular system and the conjunctive tissue diseases<sup>(4,12)</sup>. Many diseases mentioned here, due to their chronic feature, demand high cost health care and propitiate the appearance of complications, with a strong effect on the dependence degree and quality of life of the elderly.

As a consequence to chronic non-communicable diseases, the elderly make use of various medications. The

interviewed subjects used, in average, 3.7 medications/elderly individual. Regarding polypharmacy, 12 (30.8 %) used five or more medications. These numbers agree with those found in a study performed with an elderly population in Porto Alegre/RS, where the average between medications/elderly was of 3.2, with 27.0% of them using polypharmacy<sup>(19)</sup>. A study performed in institutionalized elderly demonstrated that 46.4% of them used polypharmacy<sup>(13)</sup>, a number above that found in this study.

Factors related to polypharmacy in institutionalized patients were described as follows: lack of cognitive deficit (dementia); consumption of cardiovascular medications; use of gastrointestinal and metabolism medications; more than five diagnosed diseases; time in the institution; and greater functional dependency, according to the Katz<sup>(13)</sup> scale. Many studies found that the use of multiple medications by the elderly is associated to negative health results and demonstrate that further studies are needed in order to determine the consequences associated to this use<sup>(20)</sup>.

The most used therapeutic class was cardiovascular system drugs (35.0%), similar to previous findings<sup>(4,6,12-13)</sup> and they are in agreement with the referred diseases, since the diseases in the blood system were most prevalent in this sample.

Clinically, the combination of medications is used as a therapeutic strategy for many diseases, which were prevalent in the sample, whether to reach the therapeutic objective, whether to treat comorbidities. However, these combinations can result in an adverse event to medication and trigger hospitalization or death, mainly when associated to potentially interactive and unsuitable medication for the elderly<sup>(21)</sup>.

Considering the medications used by the elderly in this study, eight are considered potentially interactive and unsuitable for the use by elderly people, they are: diclofenac, digoxin, clorpropamide, amiodarone, diazepam, lorazepam, amitriptyline, fluoxetine.

Since in the long-term care institution there is no use of medication without a medical prescription, the professionals who work with the elderly in the institution need to review the therapeutic systems they are performing. Some strategies may help to prevent and minimize adverse events from medications, among which: not prescribing unsuitable medications for the elderly, avoid prescribing medications that might interact among them, monitoring adverse reactions resulting in negative outcomes.

The use of medications, although beneficial in many occasions, may require special care. Medications used in complications of the cardiovascular system were the most prevalent, especially the hypotensive. These drugs are considered responsible for most interaction frequencies and, consequently for the possible adverse reactions to medications<sup>(9)</sup>.

Amiodarone and digoxin, drugs used by many elderly people who have cardiovascular diseases can cause severe medication interaction, constituting in highly frequent implications in polypharmacy cases because they can cause, respectively, cardiotoxicity and intoxication digitalis<sup>(9,21)</sup>.

Non-steroidal anti-inflammatory drugs, represented by the elderly in this study as diclofenac and meloxicam present high plasmatic protein bonding, and they may dislocate other medications from their bonding sites, consequently elevating the blood level in the latter. Moreover, they are unsuitable for the elderly, as their risks are higher than their benefits, and they can cause adverse reactions such as irritation, gastric ulcers and nephrotoxicity, resulting in hemorrhage, anemia, renal insufficiency and sodium retention<sup>(9,21)</sup>.

The use of oral hypoglycemic effect drugs is also not free of risks. Clorpropamide predispose hypoglycemia, which can be disguised in the elderly, especially when there is a confusion condition, increasing the number of falls<sup>(4,9,21)</sup>.

The use of medications that are active in the central nervous system, as the anxiolytic, anti-depressive and anti-psychotic drugs can cause adverse reactions with critical clinic outcomes for the elderly as falls, hip fractures, memory lost, confusion and social isolation. The identification of adverse reactions to these medications or their interactions with other drugs may make it difficult, since it is possible that some manifestations will imitate geriatric syndromes, confusion, incontinence and falls, a fact that, for many professionals and family members, can be interpreted as an elderly medical profile evolution and not as a consequence of the therapeutic regime<sup>(9,21)</sup>.

Many drug interactions present great magnitude and they can result even in the death of the subject, hospitalization, permanent injury or therapeutic failure. However, there are the cases that cause apparent damages to the elderly; however, with a silent, late impact, which is sometimes irreversible<sup>(9)</sup>.

## CONCLUSION

This study characterized the elderly living in a long-term care institution regarding the use of medications, and verified the existence of polypharmacy in 30.8% of them. The quantitative approach favored reaching its objectives.

One of the limitations of this study regards the fact of not verifying more issues related to the use of medications. As a favorable point, the recovery of one question stands out, emerging from a great research and that is still to be analyzed.

Findings demonstrated that most residents in the long-term care institution were female, widows, between 80 and 89 years old, who could read. Diseases of the

blood system were more frequent. The elderly used an average of 3.7 drugs. The most used were for cardiovascular system complications. Many medications that are considered as unsuitable for the elderly were present among the medications they used.

Vulnerability of the elderly to adverse events related to the use of medications is high due to the complexity of clinical problems, the need for multiple agents and the pharmacokinetic and pharmacodynamic alterations inherent to aging. Studies as this one demonstrate the institutionalized elderly population reality and tend to sensitize health professionals, mainly nurses, to promote the rational and careful use of medications for the analyzed population.

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