

POLYPHARMACY IN THE ELDERLY: A REVIEW OF THE LITERATURE

Polifarmácia em idosos: uma revisão da literatura

La polifarmacia en los ancianos: una revisión de la literatura

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ABSTRACT

Objective: To identify in the scientific literature, between 2016 and 2018, studies on polypharmacy in community-dwelling elderly. **Methods:** integrative review, performed in the PUBMED, BVS/BIREME, SCOPUS, WEB OF SCIENSE, EMBASE, Cochrane Library and CINAHL databases. **Results:** sixteen articles were selected for this review. Regarding the use of medication by elderly residents in the community, studies showed the prevalence of use, characteristics and factors associated with polypharmacy in the elderly; adequate knowledge of prescription drugs; and use of potentially inappropriate medications. **Conclusion:** identifying medication use in the elderly points to the need for better communication between professionals and patients, encouraging self-care, minimizing the risk of complications, preventing iatrogenesis and hospitalizations, as well as reducing mortality in the elderly due to improper medication use.

Descriptors: Aged, Aging, Polypharmacy, Chronic disease, Health of the elderly.

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RESUMO

Objetivo: Identificar na literatura científica, entre os anos de 2016 e 2018, estudos sobre a polifarmácia em idosos residentes na comunidade.

Métodos: revisão integrativa, realizada nas bases de dados PUBMED, BVS/BIREME, SCOPUS, WEB OF SCIENCE, EMBASE, Cochrane Library e CINAHL. **Resultados:** dezesseis artigos foram selecionados para esta revisão. Quanto ao uso de medicamentos por idosos residentes na comunidade, os estudos apresentaram a prevalência de uso, características e fatores associados à polifarmácia nos idosos; conhecimento adequado dos medicamentos prescritos; e uso dos medicamentos potencialmente inapropriados. **Conclusão:** a identificação do uso de medicamentos nos idosos aponta para a necessidade de melhor comunicação entre profissionais e pacientes, incentivar o autocuidado, minimizar o risco de complicações, prevenir iatrogenias e hospitalizações, assim como, reduzir a mortalidade em idosos por uso impróprio de medicamentos..

Descritores: Idoso, Envelhecimento, Polimedicação, Doença crônica, Saúde do idoso.

RESUMEN

Objetivo: Identificar en la literatura científica, entre 2016 y 2018, estudios sobre polifarmacia en personas mayores que viven en la comunidad. **Metódos:** revisión integral, realizada en las bases de datos PUBMED, BVS/BIREME, SCOPUS, WEB OF SCIENCE, EMBASE, Biblioteca Cochrane y CINAHL. **Resultados:** se seleccionaron 16 artículos para esta revisión. Con respecto al uso de medicamentos por parte de los residentes de edad avanzada en la comunidad, los estudios mostraron la prevalencia del uso, las características y los factores asociados con la polifarmacia en los ancianos; conocimiento adecuado de medicamentos recetados; y el uso de medicamentos potencialmente inapropiados. **Conclusión:** identificar el uso de medicamentos en los ancianos señala la necesidad de una mejor comunicación entre profesionales y pacientes, fomentando el autocuidado, minimizando el riesgo de complicaciones, previniendo iatrogénicos y hospitalizaciones, así como reduciendo la mortalidad en los ancianos debido al uso inadecuado de medicamentos.

Descriptores: Anciano, Envejecimiento, Polifarmaci, Enfermedad crónica, Salud del anciano.

INTRODUCTION

For humanity, the greatest longevity can be considered a success story.¹ In Brazil, the population growth of the elderly population is on the rise, it is estimated that by 2075 the peak population will be 79.2 million with ≥ 60 years of age. However, the increase in life span, the greatest conquest of the 20th century, has become a great challenge for the current century.² Currently the profile of morbidity and mortality in the country has changed due to the rapid aging of the Brazilian population, with a decrease in acute conditions of short duration, such as infectious diseases and external causes, but with an increase in the frequency of chronic non-communicable diseases.³ Therefore, concomitant to the advance of age occurs the increase of the incidence of chronic diseases and health problems,⁴⁻⁵ with greater consumption of medicines for their treatment and consequent polypharmacy (use of five or more medicines

simultaneously).⁶⁻⁷

Although there is no universally accepted definition for polypharmacy, most national and international studies consider the use of five or more drugs.⁸⁻⁹

Many elderly people use medicines continuously, the average being observed in Brazilians, from 2 to 5 drugs.^{8,10-12} The prevalence of polypharmacy varies from 5 to 32%, according to data from national studies.^{8,10,12} With the increase of life expectancy, it is necessary to know better the profile of the polypharmacy in elderly people in this age group. Facing this scenario, we consider it important to promote the discussion about the use of drugs in the elderly in the world and, for this, we propose an integrative review guided by the following question: What knowledge is produced about polypharmacy in elderly residents in the community, between the years 2016 and 2018?

Therefore, this study aims to identify in the scientific literature, between the years 2016 and 2018, studies on polypharmacy in elderly residents of the community.

METHODS

The present study used the integrative type bibliographic review method, which allows the search, critical analysis and synthesis of available evidence on the subject, allowing the identification of gaps that direct future research on the subject based on practice in evidence,¹³ and follows a standard of excellence in methodological rigor.¹⁴

For the operationalization of this revision, we use the Endnote program to manage the bibliographic references and select the studies, as explained below. The following steps were used for the identification, selection, eligibility and inclusion of studies in the review: selection of the thematic issue; definition of the databases and descriptors; establishment of the criteria for inclusion and exclusion of publications to define the sample; determination of the information taken from the articles, analysis and evaluation of the works selected in the review and interpretation of the results.¹⁵

The search in literature was carried out through the survey of scientific productions carried out in November 2018, in the main databases in the health area: PUBMED/MEDLINE (National Library of Medicine and National Institutes of Health), Portal Biblioteca Virtual em Saúde (BVS)/BIREME, SCOPUS (Scopus Info Site), WEB OF SCIENCE, EMBASE, Cochrane Library and Cumulative Index to Nursing and Allied Health Literature (CINAHL). The period from 2016 to 2018 was delimited as a time clipping.

The following criteria were used to compose the sample:

- Inclusion criteria: articles in English, Portuguese and Spanish; published in scientific journals from 2016 to 2018 and with relevance and adherence to the proposed objective.
- Exclusion criteria: duplicate articles; bibliographical

review articles of any modality; end-of-course papers, dissertations and theses; and abstracts published in event annals.

The search was performed by means of controlled descriptors, present in the Descritores em Ciência da Saúde (DeCS) and Medical Subject Headings (MESH), keywords and synonyms: "Aged, 80 and over"; "Aged"; "Polypharmacy"; "Health Status", and Boolean operators for the crossover in the database.

As a method of analysis, the publications were initially read in full and the results were analyzed and described in types of studies on polypharmacy in the elderly in the chosen period. They were also organized and presented according to the descriptors and the database, description of the articles according to the variables surveyed (author, year of publication, country, journal, sampling, objective of the study and main results), and organization of the identified themes. The critical analysis and qualitative synthesis of the selected studies were performed in a descriptive manner.

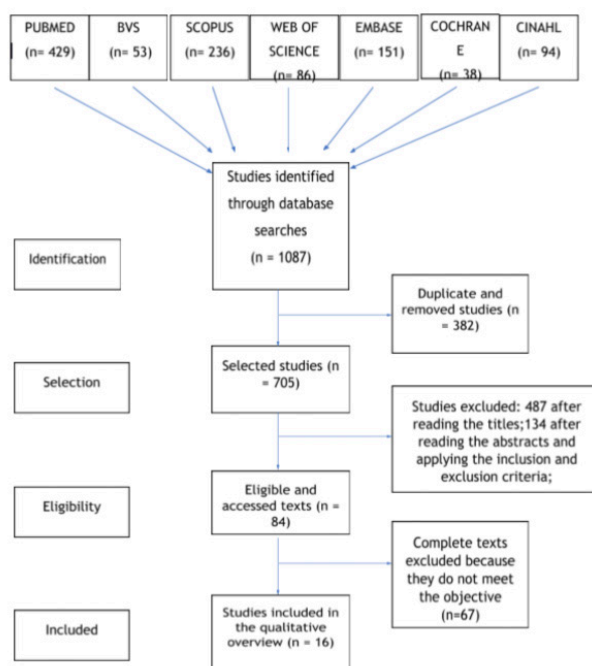
RESULTS AND DISCUSSION

After the bibliographic search, 1,087 studies were identified (Chart 1). Then, the inclusion and exclusion criteria were analyzed and finally, only studies with elderly residents in the community were selected, resulting in 16 studies in qualitative synthesis. The flowchart of the selection process of the articles is represented in Figure 1.

Table 1- Descriptors used for literature search in the main databases and number of studies identified (n = 1,087). Campinas, SP, Brazil, 2018.

Source	Descriptors				Number of studies (n=1.087)
PORTAL PUBMED	"Aged, 80 and over"	Aged	Polypharmacy	"Health Status"	429
	"Aged, 80 and over" OR "Anciano de 80 o más Años" OR "Idoso de 80 Anos ou mais"	Aged Anciano Idoso	Polypharmacy Polifarmacia Polimedicação	"Health Status" OR "Estado de Salud" OR "Nível de Saúde"	MEDLINE (43) IBECs (7) LILACS (3)
SCOPUS	"Aged, 80 and over"	Aged	Polypharmacy	"Health Status"	236
WEB OF SCIENCE	"Aged, 80 and over"	Aged	Polypharmacy	"Health Status"	86
EMBASE	"Aged, 80 and over"	Aged	Polypharmacy	"Health Status"	151
Cochrane Library	"Aged, 80 and over"	Aged	Polypharmacy	"Health Status"	38
CINAHL	"Aged, 80 and over"	Aged	Polypharmacy	"Health Status"	94

Figure 1- Flowchart for selection of the studies found. Campinas, SP, Brazil, 2018.



Of the 16 articles in English considered, in relation to the year of publication, three (18.7%) were published in 2016; eight (50%) in 2017, and six (37.5%) in 2018.

Brazil stood out as the country with the highest number of publications on the subject, corresponding to four (25%), Spain and Malaysia both with two (12.5%) each. Also included were articles from other countries such as Italy, Israel, Austria, Germany, the Netherlands, the United States, European countries, New Zealand which corresponded to one (6.25%) each. The articles were published in 14 journals, highlighting the Revista de Saúde Pública and Plos One with two articles in each journal, respectively.

The description of the articles published in the literature, according to the variables (author, year of publication, country, journal, sample and objective of the study) researched in the period from 2016 to 2018 is presented in **Chart 2**.

Table 2- Description of the articles published in the literature, according to the variables surveyed in the period from 2016 to 2018. Campinas, SP, Brazil, 2018.

Author/Year/Country	Journal	Sampling	Purpose of the study
BALA (2018) Nova Zelândia ¹⁶	<i>Eur J Clin Pharmacol</i>	70,479 with ≥ 65 years old, community citizens	Examining the prevalence of potentially inappropriate drugs in the elderly
BOSCH-LENDERS (2016) Holanda ¹⁷	<i>Age Ageing</i>	754 with ≥ 60 years in primary care environment	Identify factors associated with adequate knowledge about drug indications
COSTA (2017) Brasil ¹⁸	Revista de Saúde Pública	8,803 patients in primary health care	Characterize the use of drugs by primary health care patients
GARFINKEL (2018) Israel ¹⁹	<i>Therapeutic Advances in Drug Safety</i>	177 interviewees in homes	Evaluate the effectiveness and safety of polypharmacy based on the Garfinkel method

KIRCHMAYER (2016) Itália ²⁰	<i>European Geriatric Medicine</i>	1,122,864 elderly residents in the community	Describe the use of drugs in the elderly by conducting a cross-sectional population study in Lazio, Italy.
LIM (2017) Malásia ²¹	<i>PLoS One</i>	1.256 age ≥ 55 years in urban community	To determine the prevalence, risk factors and health outcomes associated with polypharmacy in elderly people in Malaysia.
MAYER (2016) Áustria ²²	<i>Value in Health</i>	Elderly ≥ 60 years not institutionalized	Explore the prevalence and possible determinants of polypharmacy in the Austrian population
MIDÃO (2018) 17 países europeus, além de Israel ²³	<i>Archives of Gerontology & Geriatrics</i>	34,232 with ≥ 65 years not institutionalized	To evaluate the prevalence and factors related to polypharmacy in elderly people in 17 European countries, besides Israel.
MILLER (2017) Estados Unidos ²⁴	<i>Health Serv Res</i>	16,588 senior citizens not institutionalized ≥ 65 years old	Examine the determinants of the use of potentially inappropriate drugs
MONTIEL-LUQUE (2017) Espanha ²⁵	<i>PLoS One</i>	375 with ≥ 65 years in primary care	Describe factors related to medication and quality of life in polymedicated elderly
NASCIMENTO (2017) Brasil ²⁶	<i>Revista de Saúde Pública</i>	9,000 patients interviewed in primary care	Characterize polypharmacy in primary health care patients and identify its associated factors.
NASCIMENTO (2018) Brasil ²⁷	<i>Current Medical Research and Opinion</i>	8,803 patients were interviewed in basic care	To determine and characterize the use of statins in basic health care in Brazil and assess the factors associated with the patient
NEOH (2017) Malásia ²⁸	<i>Geriatr Gerontol Int</i>	79 elderly people interviewed in the community	Evaluate adherence, barriers, belief and awareness of drug use among the elderly in Malaysia.
NICLOS (2018) Espanha ²⁹	<i>Int J Pharm Pract</i>	22,188 interviews of a nationally representative sample	To investigate the association between polypharmacy and socio-demographic factors among adults in Spain.
PEREIRA (2017) Brasil ¹⁰	<i>Revista Brasileira de Epidemiologia</i>	1,705 with ≥ 60 years living in urban area	To investigate the polypharmacy among the elderly of Florianópolis, estimating the prevalence and associated factors.
RIECKERT (2018) Alemanha ³⁰	<i>BMC Fam Pract</i>	3,904 participants were recruited in primary care	Analyze the characteristics of an older multi-morbidity population with polypharmacy

Regarding the use of drugs by elderly residents in the community, in the articles considered in this review the studies presented the prevalence of use, characteristics and factors associated with polypharmacy in the elderly; adequate knowledge of the drugs prescribed; and use of Potentially Inappropriate Drugs (PID).

PREVALENCE OF DRUG USE, CHARACTERISTICS AND FACTORS ASSOCIATED WITH POLYPHARMACY IN THE ELDERLY

The results showed that, as a consequence of population aging, the profile of elderly people who use drugs has been changing, since the prevalence of use in the more advanced age group is increasing. In the analysis of the articles of this study, a survey analyzed the percentage of polypharmacy in the elderly with age ≥ 65 years and evaluated differences between several countries, with variation of 26.3% to 39.9%. Among them, Switzerland, Croatia and Slovenia were the countries with the lowest prevalence of polypharmacy, while Portugal, Israel and the Czech Republic were the countries where the prevalence of polypharmacy was the highest.²³ The predominance of concomitant use of five or more drugs was 36.0% in the municipality of São Paulo (SP), according to the Estudo Saúde, bem-estar e envelhecimento (SABE)¹² and 39.0% in the United States, in participants of the National Health and Nutrition Examination Survey.³¹ Comparisons should be made with caution due to the differentials of access to

medicines in the different locations.

In this review, national surveys that used the age bracket of 60 years or more detected prevalence of 32% in Florianópolis (SC)³⁰ and 18.1% in the Pesquisa Nacional de Acesso, Utilização e Promoção do Uso Racional de Medicamentos (PNAUM);²⁶ other studies verified 10.3% in Cuiabá (MG)⁷ and 28.0% in Goiânia (GO).³²

Some studies did not observe differences in the proportion of use of five or more drugs (polypharmacy) according to sex,^{18,25,30} contradicting the results of other surveys.^{20,29} Considering the age group ≥ 65 years old, women presented ratios of chances of polypharmacy of 1.80 (95%CI: 1.20-2.60) in the municipality of São Paulo (SP) and 1.28 (95%CI: 1.27-1.29) in Sweden.³³ In Brazil, PNAUM found a higher prevalence of polymedication in women (20.1%; 95%CI: 18.4-21.9) than in men (15.6%; 95%CI: 13.8-17.5).⁸

There was also no difference in polypharmacy in relation to the age groups,^{18,25} differently from what was observed in Florianópolis (SC) with a sample of 1,705 elderly people, who found an increase in the prevalence of polypharmacy with age (38.0% higher in those aged 80 or older, compared to those aged 60 to 69).³⁰ A three-year follow-up study in Sweden, with more than 1.7 million elderly (age ≥ 65 years) found prevalence of polypharmacy at 53.0% (75-84 years), 65.5% (85-94 years), and 67.0% (≥ 95 years), with reference to the segment of 65-74 years (32.8%).³³

In this review, a cross-sectional study conducted in European countries (n=3,904 elderly people aged ≥ 75 years) identified a higher risk of hyperpolypharmacy (≥ 10 drugs) in individuals with multi-morbidity and obese.³⁰

Some authors point out that the practice of polymedication increases with the number of chronic diseases. 8.32 In Swedish elderly (≥ 65 years), there was an intense increase in polypharmacy with the number of chronic diseases, rising from 28.6% in those who reported one to 45.4% and 59.9% in those who reported two and three diseases, respectively, reaching 87.2% among those who had five or more diseases.³³

We verified greater consumption of drugs among the obese elderly,³⁰ because it can result from comorbidities and metabolic alterations associated to these conditions, besides changes caused by body fat in the absorption, distribution and metabolization of drugs.³⁴ In Goiânia (GO), a study identified in the bivariate analysis, a higher prevalence of polymedication in those with very increased waist circumference (34.6%), whereas in the hierarchical model, polymedication proved to be superior among the obese (RP=2.41; 95%CI: 1.24-4.70 compared to low weight.³²

ADEQUATE KNOWLEDGE OF PRESCRIBED DRUGS

A study conducted in the primary care of the Netherlands on the adequate knowledge of the indications for prescribed drugs among elderly patients in the community with polypharmacy revealed that few patients were able to

correctly inform the indications for all prescribed drugs in use. Among the factors associated with the deficit of knowledge about drugs were the high consumption of drugs, male gender and age over 80 years.¹⁶

However, in another study conducted with elderly (≥ 65 years) living in the community in Canada, the correct knowledge of the general purpose of the use of prescribed and non-prescribed drugs was assessed, and most elderly people reported good knowledge about the purpose of the drugs used.³⁵

In a study conducted in Serbia in 2014 on the needs and concerns of patients using polypharmacy, patients with diabetes showed a better understanding of the use of drugs, but those who used prolonged action nitrates had difficulty in understanding the reason for the use of these medications. Of the 440 elderly interviewees who used five or more medications simultaneously, 5.2% were not aware of the indication of the prescribed drugs.³⁶

USE OF POTENTIALLY INAPPROPRIATE DRUGS (PID)

The use of PID is related to the occurrence of Adverse Drug Reactions (ADRs), being an important public health problem for the elderly population, besides being associated to the risk of hospitalization and mortality.³⁷

ADRs can be avoided by preventing the use of PID and undesirable combinations.³⁸ Therefore, it is necessary to be clear about the factors that affect the elderly population, such as the frequent and simultaneous use of several medications³⁹ and the risk of toxicity caused by the medications due to physiological alterations of the aging process.⁴⁰

Prescribing PID to the elderly may cause actual or potential harm instead of therapeutic benefits. In several countries, to avoid the use of PID, instruments were adopted to detect its use and these were essential to optimize the drug prescription, as well as minimize the negative effects of pharmacotherapy in this population.⁴¹

Primary care aims at the treatment of diseases and prevention of illness, but this often occurs only through the prescription of drugs in medical consultations. However, professionals need to be careful with improper prescriptions that culminate in polypharmacy and its complications. The treatment of various health problems in the elderly can be enhanced through changes in lifestyle.^{41,42}

There are instruments that assess the appropriateness of prescription in the elderly based on the verification of a list of drugs considered potentially inappropriate in specific conditions or situations.⁴³ In the United States, the most frequently cited and used list of PIDs for seniors are the Beers Criteria, and in Ireland, the Screening Tool of Older Persons' Potentially Inappropriate Prescriptions (STOPP).⁴⁴

The prevalence of MPI in seniors was verified by the American Geriatrics Society's Beers Criteria (2012/2015) studying 70,479 seniors (≥ 65 years) and residents in the New Zealand community. The exposure to PID was higher

in males, aged ≥ 95 years and in those using medications active in the gastrointestinal and central nervous system.¹⁶

In the U.S., Beers (2012) criteria were applied to 16,588 non-institutionalized seniors of age ≥ 65 and it was identified that almost one-third (30.9%) of older adults used an PID; the association of PID use with poor health conditions was observed. The lower use of PID was associated with an increase in age and educational level; the study pointed to the need to address the risk conditions of MPI in educational programs directed to medical practice.²⁴

CONCLUSIONS

The results obtained in this review made it possible to identify what has been addressed in publications regarding the use of drugs by elderly residents in the community. The importance of characterizing the profile of the elderly and the prevalence of polypharmacy is highlighted, as well as understanding the indiscriminate use of potentially inappropriate drugs and the lack of knowledge of the drug indications prescribed to the elderly. Studies on drug interactions in polymedicated elderly are less frequent in the literature, denoting the importance of expanding the scope of investigation on the use of drugs in community elderly.

Some recommendations are made in the studies addressed, such as improving communication between professionals and patients and the importance of knowledge about medications by patients, in order to encourage self-care and ensure adherence to treatment, minimizing the risk of complications, in addition to preventing iatrogenicity, hospitalization and reducing mortality in the elderly due to misuse of medication.

Consequently, the challenges of Brazilian health services in the area of geriatrics and gerontology necessarily include ensuring policies that promote quality of life in the aging process of the elderly in the country.

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