

# Primary health care and use of polypharmacy by the elderly: literature review

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**Abstract. Background:** elderly individuals are becoming increasingly important due to demographic transition. This leads to new demands in terms of public health policies. In this regard, the greater use of medications by the elderly increases the risk of adverse health outcomes, which need to be assessed. **Objectives:** to identify the knowledge regarding the use of medications by the elderly in the context of primary health care produced between the years 2013 and 2023. **Methods:** a systematic review conducted on the Scopus and PubMed databases, with articles published between 2013 and 2023, focusing on polypharmacy among the elderly in primary health care. **Results:** the search yielded 471 articles, which, after applying the inclusion and exclusion criteria, resulted in the selection of 19 articles for inclusion in this review. **Discussion:** the selected studies addressed topics related to the use of polypharmacy by the elderly, highlighting: inappropriate medication prescribing, risk factors for polypharmacy, as well as solutions that facilitate medication management for the elderly. **Conclusion:** deprescription is a promising measure for reducing polypharmacy therapy among the elderly. To reduce complications and errors associated with this therapy, there is a need for collaborative efforts among healthcare professionals, the patient, and the family group.

**Keywords.** Primary Health Care, Polypharmacy, Potentially Inappropriate Medications, Family Health Strategy, Elderly People.

## 1. Introduction

Elderly individuals represent a significant and growing population contingent in Brazilian society due to demographic transition. This leads to new demands in terms of public health policies. With the aging of the population, chronic conditions gain greater visibility in healthcare. The increase in disease burden and medication use poses challenges to the healthcare system [1].

The National Health Promotion Policy, initiated in 2006, aims to control non-communicable disorders (NCD) through health promotion and prevention programs that encourage healthy lifestyles. On the other hand, data from the 2013 National Health Survey suggests that approximately 60 million

Brazilians have at least one NCD, and a significant portion uses medications chronically to manage their conditions and, thus, maintain their quality of life [2].

It's worth noting that the frequent use of medication among the elderly can be seen not only as an attempt to treat comorbidities but also to alleviate common aging-related conditions [3].

The increased use of medication among the elderly raises the risk of negative health outcomes, such as adverse drug reactions, drug interactions, therapy non-adherence, functional decline, and geriatric syndromes. Older adults are more susceptible to adverse events due to physiological changes related to aging that can impact the pharmacokinetics and

pharmacodynamics of drugs, particularly about hepatic elimination and renal excretion [4].

Given this scenario, we consider it important and propose an integrative review guided by the following objective: to conduct a literature review on the role of primary health care in the care of elderly individuals undergoing polypharmacy treatment. This proposal arises from the impact of PIM and the increased likelihood of adverse effects.

## 2. Methods

The present study is a literature review, encompassing productions that employed both qualitative and quantitative approaches regarding the use of polypharmacy by elderly individuals in primary health care.

The following databases were consulted: PubMed/Medline (National Library of Medicine and National Institutes of Health) and SCOPUS.

Next, for the search strategy, we employed the combination of keywords: "Primary Health Care" OR "Family Health Strategy" AND "Polypharmacy" AND "Elderly" OR "Older people".

To be considered, articles had to meet the following criteria:

Inclusion criteria: complete research articles and reviews in Portuguese, English, and Spanish published in scientific journals from 2013 to 2023. The following items were used for data extraction: identification of the original article, methodological characteristics, study rigor assessment, measured interventions, and findings.

Exclusion criteria: editorials, reviews, experience reports, and theoretical reflections; dissertations, theses, and monographs; abstracts published in conference proceedings; duplicated articles, incomplete articles, articles unavailable for access, or articles that did not meet the study's objectives.

Thus, the selection of studies followed the following steps: reading the titles of all found articles; reading the pre-selection abstracts according to the inclusion and exclusion criteria; and reading the full articles.

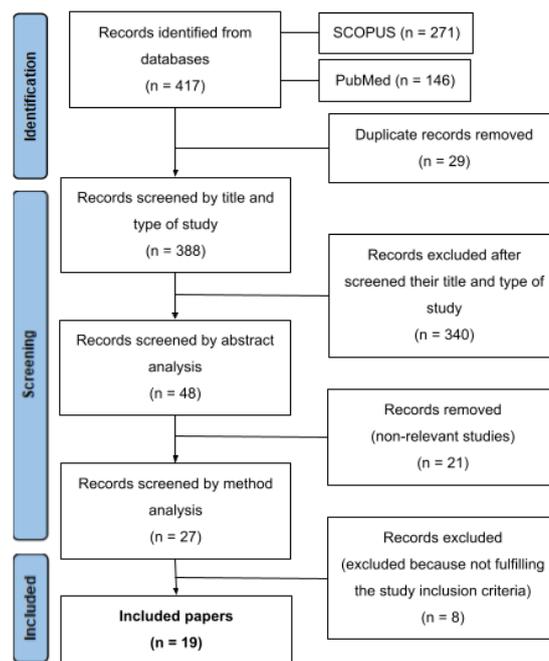
## 3. Results

**Tab. 1** - Characteristics of the articles included in the review.

Author	Year	Title
Dovjak, P.	2022	Polypharmacy in elderly people
Ramos, L. R., Tavares	2016	Polypharmacy and Polymorbidity in Older Adults in Brazil: a public health challenge
Nascimento R., Álvares.	2017	Practice of polypharmacy in the elderly registered on Unit of Primary Health Care

It is important to note that the search strategy employed the descriptors Polypharmacy, Primary Health Care, and elderly. A total of 471 references were identified, with 271 from the SCOPUS database and 146 from the PubMed database.

After reviewing the titles, 48 were preselected, and their abstracts were read. Following the exclusion of articles based on the mentioned criteria, 27 articles were selected for full reading. After further exclusion based on the same criteria, 19 articles were chosen to compose this review. For details, please refer to the flowchart (Figure 1).



**Fig. 1** - Flow diagram of the article in identification and selection process.

The reviewed studies reinforced that polypharmacy is a multifactorial process, and predictors and inappropriate prescribing are associated with negative health outcomes, such as increased frequency and types of adverse drug reactions and drug interactions involving different medication classes. Furthermore, some studies demonstrate successful primary health care interventions for optimizing prescription.

The sample for this study consisted of 19 original articles published from 2013 to 2023, as illustrated in Table 1.

Franchi C, Ardoino I.	2021	Medication adherence in community-dwelling older people exposed to chronic polypharmacy
Doherty A, boland P.	2020	Barriers and facilitators to deprescribing in primary care: a systematic review
Thomas R.	2020	Improving the Care of Older Patients by Decreasing Potentially Inappropriate Medications, Potential Medication Omissions, and Serious Drug Events Using Pharmacogenomic Data about Variability in Metabolizing Many Medications by Seniors
Hasan Ibrahim A., Barry.	2021	A systematic review of general practice-based pharmacists' services to optimize medicines management in older people with multimorbidity and polypharmacy
Ates Bulut E, ISIK A.	2022	Abuse/Misuse of Prescription Medications in Older Adults
Samara E, Nazzal Z.	2023	Potentially inappropriate medication uses and associated factors among elderly primary health care clinics attendees: A call to action
Stuhec M.	2021	Clinical pharmacist consultant in primary care settings in Slovenia focused on elderly patients on polypharmacy: successful national program from development to reimbursement
Oliveira M, Amorim W.	2015	A comparison of the Beers and STOPP criteria for identifying the use of potentially inappropriate medications among elderly patients in primary care
Amorim W, Passos L.	2021	Physician and patient-related factors associated with inappropriate prescribing to older patients within primary care: a cross-sectional study in Brazil
Rodrigues M, Nascimento.	2023	Polypharmacy and drug adherence in the elderly in the context of primary health care: cross-sectional study
Parekh, Schenker Y	2019	Deprescribing in Advanced Illness: Aligning Patient, Clinician, and Health Plan Goals
Moreira F, Jerez-Roig J.	2020	Use of potentially inappropriate medications in institutionalized elderly people: prevalence and associated factors
Lutz B, Miranda V.	2017	Potentially inappropriate medications among older adults in Pelotas, Southern Brazil
Davies L, Spiers G.	2020	Adverse Outcomes of Polypharmacy in Older People: Systematic Review of Reviews
Mascarelo A, Alves A.	2023	Incidence and risk factors for polypharmacy among elderly people assisted by primary health care in Brazil
Nascimento R, Álvares J.	2017	Polypharmacy: a challenge for the primary health care of the Brazilian Unified Health System

## 4. Discussion

### 4.1 Polypharmacy and the Elderly

Polypharmacy describes the situation where several medications are prescribed for an individual and is most defined as the concurrent use of 5 or more medications [5]. Given this context, the role of healthcare professionals in providing guidance on medication use for the elderly becomes pivotal, assisting them in overcoming challenges and establishing a secure medication regimen [6].

This review has identified an extensive body of evidence with conflicting findings regarding the association between polypharmacy and various adverse outcomes. These outcomes encompass risk factors for polypharmacy, adverse drug reactions, medication adherence, deprescription, and the role of the support network in medication management.

Thus, beyond the methodological aspects of the reviewed articles, an effort was made to identify the scope of the objects of study and subsequently categorize them into thematic categories aiming to portray the state of the art on this subject, grouping the findings based on their similarities.

### 4.2 Risk Factors for Polypharmacy

In this regard, some studies identified a higher number of chronic diseases as risk factors for polypharmacy. One of the studies points to the age group of 80 to 89 years and the marital status of divorced, widowed, or without a spouse as more frequent factors [7]. However, these variables do not provide comparable data due to the use of different parameters in each study, resulting in a wide range of outcomes.

Regarding medication groups, the most prescribed medications had actions on the gastrointestinal tract,

metabolism, cardiovascular, and nervous systems. This pattern is like what has been observed in elderly individuals in Brazil and worldwide, as it reflects common health issues in groups exposed to polypharmacy, such as hypertension, chronic pain, and diabetes mellitus [7].

The use of gastric protectors is commonly prescribed to the elderly who are taking multiple medications for preventive purposes, even though they are deemed inappropriate for prolonged use exceeding 8 weeks [8]. Such prolonged exposure increases the risk of adverse effects, including osteoporosis, colitis, nephritis, and pneumonia [7].

In addition to this, physicians' attitudes in this context can alter the quantity of prescribed medications. In this scenario, factors such as concern over medical-legal issues and patient pressure for prescriptions can lead to the recommendation of potentially inappropriate medications (PIMs), contributing to polypharmacy [7].

### **4.3 Potentially Inappropriate Medications (PIM)**

Depending on the circumstances, polypharmacy can be either appropriate or inappropriate. This includes why and how medications are being administered [9].

It's important to mention that the assessment of PIMs among the elderly varies depending on the criteria adopted, which can result in changes such as inclusion, removal, or reclassification of medications and discrepancies in comparing the results of different studies [4].

However, as reported in the literature, the most relevant predictor of inappropriate medication prescription for the elderly is the prescription of polypharmacy [9]. This factor has been linked to an increased risk of adverse events due to the heightened complexity of pharmacological therapy and a higher likelihood of prescription errors [4].

In this context, although the prescribed medications address comorbidities affecting the elderly, polypharmacy is associated with functional decline, cognitive impairment, and nutritional status impairment, conditions that can lead to medication non-adherence [10].

Regarding the pharmacological classes, among the analyzed articles, a study conducted with institutionalized elderly individuals revealed that the most prevalent medications identified as PIMs (Potentially Inappropriate Medications) were antipsychotics, benzodiazepines, and sulfonylureas. Such findings raise concerns, as these medications are associated with adverse outcomes such as stroke, residual sedative effects, increased risk of falls, cognitive impairment, and mortality [4].

In primary health care settings, benzodiazepines were identified as the most prescribed medications, followed by non-steroidal anti-inflammatory drugs

(NSAIDs) and gastric protectants. The prescription of NSAIDs is related to chronic pain, which is prevalent in many elderly individuals [9].

The prevalence of PIMs on this scale underscores the need to improve the quality of pharmacotherapy for the elderly [4]. The primary intervention recommended is to prevent inappropriate polypharmacy by applying principles of rational and appropriate prescription and deprescribing medications that are no longer necessary [9].

### **4.4 Adverse reactions and non-adherence to treatment**

Despite the beneficial effects of polypharmacy in reducing mortality, managing multimorbidity, and alleviating symptoms, the complexity of various medications, the risk of drug interactions, drug-disease interactions, and the increased risk of medication errors due to the number of prescriptions can, in turn, nullify the benefits of modern medicine [11]

Non-adherence to treatment is a common issue among the elderly. Medication interactions and adverse drug reactions during hospitalization are reported to be associated with non-adherence, which is also prevalent among elderly individuals after hospital discharge when they are using multiple medications for chronic conditions [12].

Therefore, monitoring chronic treatments from primary care with a focus on prescription and medication dispensation, improving patient understanding, and enhancing treatment success will be necessary [2].

A study conducted in the Lombardy region (Northern Italy) among elderly community-dwelling patients with polypharmacy showed low overall adherence across seven classes of medications commonly prescribed for long-term conditions in this population. Nearly 40% of patients were poorly adherent to at least one class of medications, and only around 20% adhered fully to all considered therapies [13].

Medication adherence should not be viewed as something insignificant, as it stems from the subjective experiences of individuals living with specific diagnoses and treatments. Treatment-related fears, lack of information exacerbated by hesitation to clarify doubts with the doctor, are factors that hinder therapeutic adherence [3].

### **4.5 The role of the support network in medication treatment**

To optimize medication management, patient-centered care must be achieved through successful cooperation among healthcare professionals and the active involvement of the patient in decision-making regarding their medications [13].

However, inadequate guidance at the time of hospital discharge, for example, can lead to

misunderstandings and errors in medication use when the patient returns home after a hospitalization period. People often have different information needs about medications, but generally, they report that it would be ideal to receive discharge instructions not only verbally but also in writing [3].

Furthermore, it would be beneficial for medication management in the elderly to always have a chart with information about prescribed and non-prescribed medications that they can share with their healthcare providers. Treatment effectiveness and adherence should be assessed at regular intervals, informing the patient and their family about treatment side effects and the potential for misuse [14].

Treatments aimed at increasing social support and self-esteem are acceptable interventions to reduce problematic use of prescribed medications. This approach includes identifying the causes of non-adherence, educating patients about the importance of following medication management and dosage instructions, and describing the functional and health consequences of prescription medication abuse [14].

It is essential to inquire with patients and their caregivers about their thoughts and experiences regarding their medications [15].

In this regard, studies have also highlighted the important role of the family in home care for the elderly or individuals with chronic diseases, as family members need to be aware of the effects, mode of use, and other aspects of the therapeutic regimen for the person being cared for. Among the strategies employed by family members are efforts to reduce the costs of medication treatment and the adoption of natural practices, religious beliefs, and affection as elements of care [3].

#### 4.6 Deprescribing

Potentially inappropriate medications (PIMs) among the elderly are currently a global concern due to their negative impact on the quality and cost of healthcare. They lead to unnecessary waste of healthcare resources, increasing the risk of hospitalization, additional medication prescriptions, and higher rates of morbidity and mortality [16].

In recent years, the practice of deprescribing has gained formal recognition and momentum, with the development of programs and funding streams to better define ideal deprescribing practices and support their implementation.

Deprescribing involves a "systematic process of identifying and discontinuing medications when the existing or potential harms outweigh the existing or potential benefits in the context of an individual patient's care goals, functional status, life expectancy, values, and preferences" [17].

One significant solution to achieve successful medication deprescription lies in fostering

collaboration and coordination between physicians and pharmacists, particularly within primary healthcare settings. The Health Insurance Institute of Slovenia, for instance, funded the development, implementation, and evaluation of a pilot project within the country from 2012 to 2015. This initiative enabled all general practitioners to refer patients to clinical pharmacists in primary care settings for medication reviews. The pilot initiative focused primarily on elderly patients experiencing polypharmacy. The results revealed that such an approach significantly benefits patients managing multiple diseases and medications, a population often composed of elderly individuals, yielding positive outcomes across various pharmacotherapy measures for numerous patients [18].

Nevertheless, a complex set of barriers impedes safe prescribing interventions for individuals coping with multimorbidity and polypharmacy. Barriers related to health inequality encompass challenges faced by the elderly population, including the absence of evidence-based guidance for elderly individuals contending with polypharmacy and multimorbidity. Additional challenges involve ensuring continuity of care for the elderly and addressing barriers affecting individuals with cognitive and/or sensory impairments, primarily the elderly but not exclusively [17].

Furthermore, while the practice of deprescribing is gaining momentum, it is crucial to address quality measurement and provider reimbursement as potential barriers to widespread adoption. Given that numerous quality measures predominantly focus on medication utilization and adherence, deprescribing efforts may inadvertently impact the quality ratings of primary care providers and health plans, as well as influence value-based reimbursement structures [19].

#### 5. Conclusion

The results achieved in this review have demonstrated that polypharmacy among the elderly is a broad subject that can be explored from various angles and using different methodologies.

From this standpoint, this review aimed to give priority to specific topics, including the consequences of excessive drug prescriptions for the elderly population, where there is a concerning issue related to potentially inappropriate medications (PIMs). The study also delved into the risk factors associated with polypharmacy, which, according to research findings, contribute to an increase in cases of chronic illnesses. Adverse reactions and non-compliance with treatment were considered, considering the potential risks arising from drug-disease interactions, possible medical errors, and an analysis of treatment adherence, which is a crucial aspect of the health-disease process, particularly for the elderly population.

The concept of deprescribing emerged as a promising approach to reducing instances of

polypharmacy within this social group. Furthermore, the review examined the role of the support network in medication therapy, emphasizing the need for collaborative and effective efforts among healthcare professionals, active patient engagement in the process, and family involvement.

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