

Adherence and barriers to adherence to pharmacotherapy: relationship with morbidities and drug classes in older adults

Adesão e barreiras à adesão à farmacoterapia: relação com morbidades e classes medicamentosas em idosos

Adherencia y barreras a la adherencia a la farmacoterapia: relación con morbilidades y clases de fármacos en ancianos

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ABSTRACT

Objective: to verify the relationship of adherence and barriers to adherence to medication with morbidities and classes of medication used by older people. **Methods:** this is an analytical cross-sectional study carried out at a specialty outpatient clinic in the city of São Paulo (SP, Brazil) between March and November 2019. Data collection involved transcribing prescriptions and applying the Morisky Green test and the Brief Medical Questionnaire (BMQ). The likelihood ratio and Fisher's exact tests were used for analysis ($p < 0.05$). **Results:** one hundred seventeen older people participated. No relationship was observed between adherence to pharmacotherapy and morbidities or classes of medication. An association was found between barriers to adherence in the three dimensions of the BMQ and the number of medicines ($p < 0.0001$); between therapeutic regimen barriers and analgesics ($p = 0.020$); between belief barriers and analgesics ($p = 0.034$) and diuretics ($p = 0.037$); and between recall barriers and antihypertensives ($p = 0.0004$), statins ($p = 0.0024$), and oral antidiabetics ($p = 0.0134$). **Conclusion:** older adults present different types of barriers to medication adherence. Beliefs and recall barriers are associated with varying classes of drugs, such as antihypertensives, diuretics, statins, oral antidiabetics, and analgesics and anti-inflammatories.

Descriptors: Medication Adherence; Barriers to Access of Health Services; Treatment Adherence and Compliance; Aging.

RESUMO

Objetivo: verificar a relação de adesão e de barreiras na adesão à medicação com morbidades e classes de medicamentos utilizados por idosos. **Métodos:** estudo transversal analítico, realizado em um ambulatório de especialidades na cidade de São Paulo (SP, Brasil), entre março e novembro de 2019. A coleta de dados envolveu transcrição dos receituários e a aplicação do teste de Morisky Green e do Brief Medical Questionnaire (BMQ). Para análise foram utilizados os testes de Razão de Verossimilhança e o Exato de Fisher ($p < 0,05$). **Resultados:** participaram 117 idosos. Não foi observada relação entre adesão à farmacoterapia e morbidades ou classes de medicamentos. Foi encontrada associação entre barreiras para adesão nas três dimensões do BMQ e número de medicamentos ($p < 0,0001$); entre barreiras de regime terapêutico e analgésicos ($p = 0,020$); entre barreira de crenças e analgésicos ($p = 0,034$) e diuréticos ($p = 0,037$); e entre barreiras de recordação e anti-hipertensivos ($p = 0,0004$), estatinas ($p = 0,0024$) e antidiabéticos orais ($p = 0,0134$). **Conclusão:** idosos apresentam barreiras de distintas naturezas para adesão à medicação. Notadamente as barreiras de crenças e de recordação

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estão associadas à diferentes classes medicamentosas, tais como os anti-hipertensivos, diuréticos, estatinas, antidiabéticos orais e analgésicos e anti-inflamatórios.

Descritores: Adesão à Medicação; Barreiras ao Acesso aos Cuidados de Saúde; Cooperação e Adesão ao Tratamento; Envelhecimento.

RESUMEN

Objetivo: verificar la relación entre la adherencia y las barreras a la adherencia a la medicación con las morbilidades y las clases de medicación utilizadas por los ancianos. **Métodos:** se trata de un estudio transversal analítico realizado en un ambulatorio de especialidad de la ciudad de São Paulo (SP, Brasil) entre marzo y noviembre de 2019. La recolección de datos incluyó la transcripción de recetas y la aplicación del test de Morisky Green y del Brief Medical Questionnaire (BMQ). Para el análisis de los datos se utilizaron las pruebas de razón de verosimilitud y exacta de Fisher ($p < 0,05$). **Resultados:** participaron 117 ancianos. No se observó ninguna relación entre la adherencia a la farmacoterapia y las morbilidades o las clases de medicación. Se encontró una asociación entre las barreras a la adherencia en las tres dimensiones del BMQ y el número de medicamentos ($p < 0,0001$); entre las barreras al régimen terapéutico y los analgésicos ($p = 0,020$); entre las barreras a las creencias y los analgésicos ($p = 0,034$) y los diuréticos ($p = 0,037$); y entre las barreras al recuerdo y los antihipertensivos ($p = 0,0004$), las estatinas ($p = 0,0024$) y los antidiabéticos orales ($p = 0,0134$). **Conclusión:** los ancianos presentan diferentes tipos de barreras para la adherencia a la medicación. En particular, las barreras de creencia y recuerdo se asocian a distintas clases de fármacos, como antihipertensivos, diuréticos, estatinas, antidiabéticos orales y analgésicos y antiinflamatorios.

Descritores: Cumplimiento de la Medición; Barreras de Acceso a los Servicios de Salud; Cumplimiento y Adherencia al Tratamiento; Envejecimiento.

INTRODUCTION

The number of people aged 65 and over is growing worldwide, and estimates suggest that this group could reach 1.5 billion by 2050, representing 16% of the population; in other words, one in six people in the world will be 65 or over⁽¹⁾.

The World Health Organization (WHO) considers people aged 65 and over in developed countries and 60 and over in developing countries to be older adults. In Brazil, this population corresponded to 14% in 2020, i.e., around 30 million Brazilians are aged 60 or over. According to data from the *Instituto Brasileiro de Geografia e Estatísticas* - IBGE (Brazilian Institute of Geography and Statistics), there was a growth of more than 4% per year between 2012 and 2022, showing a figure of 1 million more older adults per year⁽²⁻⁴⁾.

As the quality of life improves and life expectancy increases⁽⁵⁻⁸⁾, the epidemiological transition associated with an ageing population will become one of the country's challenges, since approximately 58.3% of the elderly population has more than one chronic non-communicable disease (CNCD) and 34.4% live with three or more diseases^(2,3).

Chronic non-communicable diseases are responsible for 72% of the causes of mortality in Brazil. In terms of prevalence, these include chronic cardiovascular diseases, cancer, type 2 diabetes mellitus (DM2), and chronic respiratory diseases^(4,5). The main consequences of these chronic conditions are the possibility of disability and increased dependence on daily activities^(4,5).

In this context, polypharmacy has become more prevalent in recent years, since the main treatment in-

dicated for older adults with multimorbidities is related to the chronic use of at least five drugs or more at the same time⁽⁶⁾.

There is still no consensus on the definition of poly-medication or polypharmacy. One of the possibilities is to consider it as the chronic and continuous use of five or more medications⁽⁶⁾, which can lead to undesirable consequences for older people and society, including potential drug interactions, longer hospitalizations or admissions, problems related to the inappropriate use of medications, non-adherence to therapy, barriers to drug adherence, worsening quality of life, and increased costs over time, both for the health system and for families⁽⁶⁾.

Non-adherence to medication, especially in the presence of polypharmacy among older people with multimorbidity, is recognized as a public health problem worldwide^(7,8). This is even worse in vulnerable older people with advanced age, cognitive impairment, and unfavorable nutritional status⁽⁸⁾.

In this sense, one study found that the greater the number of drugs, more than six drugs, and in different therapeutic classes, the lower the adherence, compared to the adherent group using three drugs. The main therapeutic classes reported by the participants were antihypertensives and antilipidemics⁽⁹⁾.

The damage caused by non-adherence becomes more serious, especially for the vulnerable and frail elderly, with therapeutic regimens containing more than one class of medication for the treatment of more than one morbidity, thus requiring increasing attention to the self-management of potentially inappropriate med-

ications, drug interactions, and the identification of adverse reactions to their use⁽⁷⁻⁹⁾.

Despite the risks, polypharmacy may be necessary, and its effectiveness in treating NCDs requires patient adherence to the prescribed pharmacotherapy⁽⁶⁾. Non-adherence to medication is a significant problem in situations where self-administration of oral medication is necessary, especially when multiple drugs are used⁽⁶⁾. In this context, it is important to point out that older people can find it difficult to self-manage their treatment daily⁽⁶⁾.

Among the reasons for non-adherence to medication, considering different drug classes, mainly for the treatment of systemic arterial hypertension (SAH), DM2, and depression, the side effects of the therapeutic regimen and advanced age stood out. Thus, recognizing and addressing the factors that can improve adherence is important for clinical efficacy and optimizing pharmacological therapy with a focus on adherence⁽¹⁰⁾.

Another important aspect that helps with medication adherence is identifying the barriers that contribute to non-adherence. One study found that, among patients being monitored for SAH, the main barriers to adherence to medication were absence from scheduled appointments, not having the medication, lack of transportation, financial difficulties, conflicting schedules with other activities - especially work, forgetfulness, being asymptomatic, not knowing about the medication and taking the medication too quickly⁽¹¹⁾. Still, in relation to the treatment of hypertension, other factors that contribute to non-adherence to medication include sociodemographic, clinical, and environmental aspects, the quality of the relationship with the healthcare team and professionals, complex therapeutic regimens, combined multiple daily doses for different morbidities and, in the long term, side effects of medication, cognitive and functional decline, neurodegenerative diseases, and alcohol and drug abuse⁽¹²⁾.

Non-adherence and barriers to the use of medication in people with hypertension are particularly important because the consequences, such as the occurrence of acute cardiovascular events, acute myocardial infarction, stroke, heart failure, and chronic kidney disease, can increase the use of emergency services, hospital admissions, and the costs of health systems⁽¹²⁾.

Investigating adherence and barriers to medication adherence and possible associated factors considering morbidities and drug classes in older people can contribute to defining and developing strategies that can have a positive impact on the clinical management of morbidities and the correct use of multiple medications.

Therefore, this study aimed to verify the relationship between adherence and barriers to medication adherence in relation to the morbidities and classes of medication used by older people.

METHODS

This is a descriptive, analytical, and cross-sectional study, whose report was prepared in line with the recommendations of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE)⁽¹³⁾. The study was carried out from March to November 2019 in the city of São Paulo (SP, Brazil), at a specialty outpatient clinic for older people, located in the Southeast region, whose average number of patients is 288 per month.

The sample was non-probabilistic, for convenience. A pilot sample was carried out with 20 patients. The formula used was:

$$N = [(z\alpha + z\beta) \div C]^2 + 3,$$

where,

- N = total sample;
- α = significance level (bilateral);
- β = 1-power of the test;
- $C = 0.5 \times \ln[(1+r)/(1-r)]$, r = Correlation coefficient;

The values adopted were $Z\alpha = 95\%$, $Z\beta = 80\%$, $r = -0.248$.

By replacing the values in the formula, the total obtained was 117 participants.

The study included people aged 60 years and older who attended the outpatient clinic and could understand and answer the study questionnaires. Sociodemographic and clinical data was collected through individual interviews, recorded on a structured form, with fields for information on age, gender, education, marital status, occupation, family income, morbidities, medication in continuous use, number of medications daily, and drug classes.

To assess patient adherence to drug treatment, we used the Morisky Green Test (MGT)^(14,15), an instrument consisting of four questions: "Do you sometimes have problems remembering to take your medication?"; "Do you sometimes neglect to take your medication?"; "When you are feeling better, do you sometimes stop taking your medication?" and "Do you sometimes stop taking your medication if you feel worse?". The test has a score for high, medium, and low adherence to drug treatment. A negative answer to four negative questions means high adherence; when one or two answers are positive, the patient is classified as medium adherence,

and if three or four answers are positive, the individual is in the low adherence group⁽¹⁴⁾.

The Brief Medical Questionnaire (BMQ) was used to identify barriers to adherence to treatment from the patient's perspective^(16,17). It is an instrument divided into three domains: regimen, beliefs, and recall; the first verifies *barriers to the patient's therapeutic regimen* in relation to adherence to the prescribed treatment; the second assesses *barriers to individuals' beliefs* about the effectiveness of the therapy and reports of unwanted side effects; and the third domain involves *recall barriers* to the use of medications. Affirmative answers in each domain identify barriers to the prescribed treatment regimen, beliefs in the treatment, and recall in relation to taking the medication^(16,17).

Polypharmacy, or the use of multiple drugs, was defined in this study as the use of five or more drugs simultaneously by older people,⁽⁶⁾ and the drug classes were established based on the Anatomical Therapeutic Chemical (ATC) system⁽¹⁸⁾, proposed by the World Health Organization (WHO), in which the active substances are divided by the organs or systems in which they act and their therapeutic, pharmacological, and chemical properties. Drugs are classified into five different levels, among which the first level is made up of the 14 main anatomical or pharmacological groups, including A: Digestive system and metabolite, B: Blood system, C: Cardiovascular system, D: Dermatological agents, G: Genitourinary system and sex hormones, H: Preparations for the hormonal system excluding sex hormones and insulins, J: Antimicrobials, L: Antineoplastics and immunomodulatory agents, M: Musculoskeletal system, N: Nervous system, P: Antiparasitic agents and repellents, R: Respiratory system, S: Agents for sensory organs, and V: Other. The second level is related to the pharmacological or therapeutic subgroup, the third and fourth levels are related to the chemical, pharmacological, or therapeutic subgroup, and the fifth is made up of chemical substances.

Continuous variables (age, schooling, family income, number of medications) were analyzed by means, minimum and maximum, and median, and categorical variables (gender, marital status, occupation, morbidities, and classes of medications) were analyzed by absolute frequency and percentage.

The likelihood ratio test was used to compare adherence to pharmacological therapy based on the Morisky Green test score (high, medium, low adherence) according to morbidity and drug class.

Fisher's exact test was used to compare morbidities and drug classes with the presence of barriers to adherence, according to the Brief Medical Questionnaire

(barriers, no barriers - in each of the three domains: drug regimen, beliefs, and recall).

A significance level of 5% ($p \leq 0.05$) was used in all analyses.

The data collected was stored in an electronic spreadsheet using the Microsoft Office, Excel® (2016, Microsoft Corporation, United States) program and analyzed using SPSS - The Statistical Package for the Social Sciences® (version 22.0, 2013, IBM, United States).

The study was approved by the Research Ethics Committee of the Federal University of São Paulo (CAAE: 03691418.3.0000.5505) following resolution 466/12 for research with human subjects of the National Health Council (CNS)⁽¹⁹⁾. The older people were previously informed about the study and voluntarily consented to participate by signing an Informed Consent (IC). The secrecy and confidentiality of the information collected was ensured.

RESULTS

A total of 117 older people participated, most of whom were female (92.3%), retired or on a pension (80.3%), and widowed (37.6%). Their average age was 71.5 years, ranging from 60 to 87 years old, with a median of 71 years; an average of 6.5 years of schooling (incomplete primary education); average family income of 1.85 minimum wages (2019 reference value for the minimum wage = R\$ 998.00), ranging from zero to six, with a median of two minimum wages.

The leading chronic conditions identified among them were (Table 1) systemic arterial hypertension - SAH (75.2%), followed by dyslipidemia (43.6%), DM2 (36.8%), chronic pain (27.4%), joint diseases (24.8%), and diseases related to the thyroid system (23.9%).

The average number of medications collected in the prescriptions of the older people was six, with a minimum of two, a maximum of 17, and a median of five.

Considering the body systems, it can be seen that the cardiovascular system is the predominant target of therapies, followed by the digestive and metabolic systems and the skeletal muscle system (Table 2). The drug classes predominantly indicated for use among older people were: antihypertensives (72.6%), lipid-modifying agents, statins (56.4%), analgesics, and anti-inflammatories (45.3%); vitamins (43.6%), diuretics (38.5%), oral antidiabetics and insulins (35.9%), proton pump inhibitors (29.9%), platelet antiaggregants, and anticoagulants (28.2%). Also noteworthy in this population was the prescription of antidepressants and benzodiazepines (18.8%) (Table 2).

Table 1 - Distribution of chronic non-communicable diseases in older people (n = 117), specialty outpatient clinic, São Paulo, São Paulo, Brazil, 2019

CNCDs ^a	Total	
	n	%
DM2 ^b		
No	74	63.2
Yes	43	36.8
SAH ^c		
No	29	24.8
Yes	88	75.2
Dyslipidemia		
No	66	56.4
Yes	51	43.6
Thyroid diseases		
No	89	76.1
Yes	28	23.9
Chronic pain		
No	85	72.6
Yes	32	27.4
Joint diseases		
No	88	75.2
Yes	29	24.8
Depression		
No	108	92.3
Yes	9	7.7
Other		
No	81	69.2
Yes	36	30.8

Note: ^a CNCD - Chronic Non-Communicable Diseases; ^b DM2 - Diabetes Mellitus type 2; ^c SAH - Systemic Arterial Hypertension.

Adherence was considered low in 52 (44.4%) participants, medium in 52 (44.4%), and high in 13 (11.1%) older people. Total adherence, including the three evaluation categories, was only associated with family income ($p = 0.0180$).

No association was found between adherence to drug therapy and the number of drugs ($p = 0.1517$), and morbidities such as hypertension ($p = 0.6890$), DM2 ($p = 0.2637$), dyslipidemia ($p = 0.6764$), musculoskeletal system diseases ($p = 0.4331$), and depression ($p = 0.3114$).

Similarly, there was no association between adherence and drug classes, such as antihypertensives ($p = 0.8695$), statins ($p = 0.8552$), oral antidiabetics and insulins ($p = 0.2131$), analgesics and anti-inflammatories ($p = 0.8061$), diuretics ($p = 0.4437$), and antidepressants and benzodiazepines ($p = 0.3043$).

Table 2 - Frequency of types of drugs and drug classes, according to the ATC (Anatomical Therapeutic Chemical) classification, prescribed to older people (n = 117), specialty outpatient clinic, São Paulo, São Paulo, Brazil, 2019

Number of drugs and drug classes	Total	
	n	%
A. Digestive and metabolic systems		
A02. Proton pump inhibitors		
No	82	70.1
Yes	35	29.9
A10. Oral antidiabetics and insulins		
No	75	64.1
Yes	42	35.9
A11. Vitamins		
No	66	56.4
Yes	51	43.6
B. Blood system		
B01. Platelet antiaggregants and anticoagulants		
No	84	71.8
Yes	33	28.2
C. Cardiovascular system		
C02. Antihypertensives		
No	32	27.4
Yes	85	72.6
C03. Diuretics		
No	72	61.5
Yes	45	38.5
C10. Lipid-modifying agents and statins		
No	51	43.6
Yes	66	56.4
H. Hormone system preparations		
H03. Synthetic thyroid hormone		
No	85	72.6
Yes	32	27.4
M. Musculoskeletal system		
M01. Analgesics and anti-inflammatories		
No	64	54.7
Yes	53	45.3
N. Nervous system		
N05/O6. Antidepressants and benzodiazepines		
No	95	81.2
Yes	22	18.8
V. Other		
No	78	66.7
Yes	39	33.3

There was an association between barriers in the medication regimen domain and the use of analgesics and anti-inflammatory drugs ($p = 0.020$) (non-tabular data).

An association was found between belief barriers to adherence (Table 3), reports of chronic pain ($p = 0.0032$), and use of analgesics and anti-inflammatories ($p = 0.0346$), diuretics ($p = 0.0372$), and platelet antiaggregants ($p = 0.0166$).

An association was found between medication adherence barriers related to recall (Table 4) and SAH ($p = 0.0002$), DM2 ($p = 0.0129$), and dyslipidemia ($p = 0.0412$), antihypertensives ($p = 0.0004$), statins ($p = 0.0024$), oral antidiabetics and insulins ($p = 0.0134$), proton pump inhibitors ($p = 0.0316$), and diuretics ($p = 0.0068$).

Table 3 - Relationship between belief barriers to adherence, morbidities, and classes of medication used by older people ($n = 117$), specialty outpatient clinic, São Paulo, São Paulo, Brazil, 2019

Continue...

Variables	Brief Medical Questionnaire – Beliefs			p-value*
	No barrier (n = 76/%)	Barrier (n = 41/%)	Total (n = 117/100%)	
SAH ^a and cardiovascular diseases				
No	22 (28.9)	7 (17.1)	29	0.1558
Yes	54 (71.1)	34 (82.9)	88	
DM2 ^b				
No	51 (67.1)	23 (69.9)	74	0.2387
Yes	25 (32.9)	18 (39.1)	43	
Dyslipidemia				
No	42 (44.8)	24 (58.5)	66	0.7333
Yes	34 (55.2)	17 (41.5)	51	
Joint diseases				
No	59 (77.6)	29 (70.3)	88	0.4095
Yes	17 (22.4)	12 (29.2)	29	
Endocrine system diseases				
No	59 (77.6)	30 (73.1)	89	0.5895
Yes	17 (22.4)	11 (26.9)	28	
Depressive disorders and anxiety				
No	71 (93.2)	37 (90.2)	108	0.7178
Yes	5 (6.8)	4 (9.8)	9	
Chronic pain				
No	62 (81.5)	23 (56.0)	85	0.0032
Yes	14 (18.5)	18 (44.0)	32	
Oral antidiabetics and insulins				
No	52 (68.4)	23 (56.0)	75	0.1849
Yes	24 (31.6)	18 (44.0)	42	
Proton pump inhibitors				
No	57 (75.0)	25 (60.9)	82	0.1140
Yes	19 (25)	16 (39.1)	35	
Platelet antiaggregants and anticoagulants				
No	49 (64.4)	35 (85.3)	84	0.0166
Yes	27 (35.6)	6 (14.7)	33	

Table 3 - Relationship between belief barriers to adherence, morbidities, and classes of medication used by older people (n = 117), specialty outpatient clinic, São Paulo, São Paulo, Brazil, 2019

Conclusion.

Variables	Brief Medical Questionnaire – Beliefs			p-value*
	No barrier (n = 76/%)	Barrier (n = 41/%)	Total (n = 117/100%)	
Antihypertensives				
No	24 (75.0)	8 (19.5)	32	0.1624
Yes	52 (61.2)	33 (80.5)	85	
Diuretics				
No	52 (68.4)	20 (48.7)	72	0.0372
Yes	24 (31.6)	21 (51.3)	45	
Statins				
No	32 (42.1)	19 (46.3)	51	0.6593
Yes	44 (57.9)	22 (53.7)	66	
Synthetic thyroid hormone				
No	58 (68.2)	27 (65.8)	85	0.2258
Yes	18 (56.3)	14 (34.2)	32	
Analgesics and anti-inflammatories				
No	47 (76.3)	17 (41.4)	64	0.0346
Yes	29 (23.7)	24 (58.6)	53	
Antidepressants and benzodiazepines				
No	65 (81.5)	30 (73.1)	95	0.1027
Yes	11 (18.5)	11 (26.9)	22	

Note: * Fisher's Exact Test; ^a SAH - systemic arterial hypertension; ^b DM2 - diabetes mellitus type 2.**Table 4** - Relationship between recall barriers to adherence and morbidities and classes of medication used by older people (n = 117), specialty outpatient clinic, São Paulo, São Paulo, Brazil, 2019

Continue...

Variables	Brief Medical Questionnaire - Recall			p-value*
	No barrier (n=10/%)	Barrier (n=107/%)	Total (n=117/100%)	
SAH ^a				
No	8 (80.0)	21 (19.6)	29	0.0002
Yes	2 (20.0)	86 (80.4)	88	
DM2 ^b				
No	10 (100.0)	64 (59.8)	74	0.0129
Yes	0 (0.0)	43 (40.2)	43	
Dyslipidemia				
No	9 (90.0)	57 (53.2)	66	0.0412
Yes	1 (10.0)	50 (46.8)	51	
Joint diseases				
No	7 (70.0)	81 (75.7)	88	0.7074
Yes	3 (30.0)	26 (24.3)	29	
Endocrine system diseases				
No	9 (90.0)	80 (74.7)	89	0.4476
Yes	1 (10.0)	27 (25.3)	28	

Table 4 - Relationship between recall barriers to adherence and morbidities and classes of medication used by older people (n = 117), specialty outpatient clinic, São Paulo, São Paulo, Brazil, 2019

Conclusion.

Variables	Brief Medical Questionnaire - Recall			p-value*
	No barrier (n=10/%)	Barrier (n=107/%)	Total (n=117/100%)	
Depressive disorders and anxiety				
No	9 (90.0)	99 (92.5)	108	0.5659
Yes	1 (10.0)	8 (7.5)	9	
Oral antidiabetics and insulins				
No	10 (100.0)	65 (60.7)	75	0.0134
Yes	0 (0.0)	42 (39.3)	42	
Proton pump inhibitors				
No	10 (100.0)	72 (67.2)	82	0.0316
Yes	0 (0.0)	35 (32.8)	35	
Platelet antiaggregants and anticoagulants				
No	8 (80.0)	76 (73.8)	84	0.7229
Yes	2 (20.0)	31 (26.2)	33	
Antihypertensives				
No	8 (80.0)	24 (22.4)	32	0.0004
Yes	2 (20.0)	83 (77.6)	85	
Diuretics				
No	10 (100.0)	62 (57.9)	72	0.0068
Yes	0 (0.0)	45 (42.1)	45	
Statins				
No	9 (90.0)	42 (39.2)	51	0.0024
Yes	1 (10.0)	65 (60.8)	66	
Synthetic thyroid hormone				
No	8 (80.0)	77 (71.9)	85	0.7255
Yes	2 (20.0)	30 (28.1)	32	
Analgesics and anti-inflammatories				
No	7 (70.0)	57 (53.2)	64	0.3450
Yes	3 (30.0)	50 (46.8)	53	
Antidepressants and benzodiazepines				
No	8 (80.0)	87 (81.3)	95	1.0000
Yes	2 (20.0)	20 (18.7)	22	

Note: * Fisher's Exact Test; ^a SAH - systemic arterial hypertension; ^b DM2 - diabetes mellitus type 2.

DISCUSSION

Among older people with an average age of 71.5 years, 6.5 years of schooling, and a low income (average of 1.85 minimum wages), the main chronic diseases identified were SAH, dyslipidemia, DM2, diseases related to the musculoskeletal system, chronic pain, diseases related to the endocrine system, and depression. The drugs most commonly used to treat these conditions were antihypertensives, diuretics, statins, oral antidiabetics, insulins, analgesics and anti-inflammatories, and

synthetic thyroid hormones. Adherence to these drugs in the population investigated was considered low to medium.

Barriers to adherence to medication use in the therapeutic regimen domain were significantly associated with analgesics and anti-inflammatories; in the beliefs domain, they were associated chronic pain, the use of platelet antiaggregants and anticoagulants, diuretics and analgesics and anti-inflammatories; barriers to adherence in the recall domain were associated with SAH,

DM2, dyslipidemia, the use of oral antidiabetics and insulins, proton pump inhibitors, antihypertensives, diuretics, and statins.

Low medication adherence, as identified in this study, has been recurrently reported among older people in Brazil⁽²⁰⁾ and other countries around the world^(21,22).

According to a study carried out in São Paulo with 59 individuals aged between 35 and 85 years (mean 61 ± 11.50 years) who had coronary artery disease, the main self-reported comorbidities were SAH (89.3%), dyslipidemia (67.8%), and DM (54.2%), and the use of 4.8 drugs on average per day⁽²⁰⁾. The BMQ identified that 50.8% of them had potential for non-adherence, and 37.3% were non-adherent.

In other countries, such as Indonesia, a similar phenomenon is repeated, as shown by a study of 266 people treated in primary care centers, which investigated the relationship between barriers (Identification of Medication Adherence Barriers - IMAB-A questionnaire) to adherence to therapy and adherence (Adherence to Refills and Medication Scale - ARMS questionnaire) to medication in patients with DM2⁽²¹⁾. The most commonly reported barriers were the unwanted effects of the medication, changing the therapeutic regimen, not buying medication when it runs out, and worrying about other people's judgment regarding medication use. Regarding adherence, female patients, those with normal weight (body mass index), and those with health insurance had a lower level of adherence⁽²¹⁾.

Still on the subject of non-adherence to drug therapy, a cross-sectional study conducted in Europe (Lithuania), using the TMG scale, interviewed 171 people, with a non-adherence rate of 46.2%. Although 61.4% of the participants showed no concern about the use of the drugs, the others (38.6%) reported uncertainty about the need, safety, and efficacy of the drugs, as well as ignorance about the risks of serious complications if the medication was not used. The main reasons for not adhering to medication were forgetfulness (29.2%), concern about dependence (13.5%), and unfavorable side effects (10.5%)⁽²²⁾. These results point to difficulties related to beliefs and memories.

Regarding the difficulties that prevent adherence to pharmacotherapy, a cross-sectional study carried out in the primary health care (PHC) network in Rio Grande do Sul (Brazil), using the BMQ scale, showed that only 20.0% of participants were adherent to SAH treatment and 46.2% were likely to be adherent. The main difficulties related to low adherence to medication were the use of two or more antihypertensive drugs ($p = 0.000$) and difficulty in reading the packaging of medication ($p = 0.011$). As for the barriers to pharmacotherapy for

blood pressure control, 88.5% were associated with the recall domain, 69.5% with the therapeutic regimen, and 13.1% with beliefs, all of which were statistically significant⁽²³⁾.

Once again, barriers relating to the belief and recall domains were linked to the discontinuation of therapy (diuretics and antihypertensives, respectively). These can be minimized through health education⁽⁶⁾, an activity that nurses must carry out in order to control morbidities.

In contrast to the results of the present study, a cross-sectional study of 193 elderly people in the state of São Paulo (SP), based on the TMG scale, found a prevalence of good adherence to drug treatment for SAH of 57.5%, regular adherence of 37.5%, and poor adherence of 8.8%. Good adherence to therapy was associated with average blood pressure (inversely associated; $p = 0.032$), length of tobacco use (inversely associated; $p = 0.035$), and higher schooling (directly associated; $p = 0.011$)⁽²⁴⁾. Although the results show a higher proportion of elderly people adhering to medication, 42.5% did not show good adherence, alerting us to the need to implement strategies to reduce this percentage. To this end, this study's authors consider implementing constant blood pressure checks as a strategy to increase medication adherence.

In this sense, another cross-sectional study conducted with 107 elderly people undergoing outpatient care at a teaching hospital in Rio Grande do Sul (Brazil) found that, on average, they used five medications a day; 86.9% were considered to be adherent to the prescribed treatment. There was a correlation between believing in the importance of medicines ($p = 0.001$) and willingness to use them ($p = 0.004$)⁽²⁵⁾, showing that the belief that medicine is of the utmost importance can favor adherence to medication. In this same study, regardless of the high percentage of adherence, some barriers to adherence to pharmacotherapy were found and were related to lack of information (they did not know the names of the drugs and only used them when symptoms were present) and material (they did not follow medical prescriptions)⁽²⁵⁾.

This same context is repeated in another study carried out in Saudi Arabia, which analyzed 212 people with DM2 treated in outpatient clinics, whose prescribed therapy was two antidiabetics on average. The results showed that 50.9% of the participants had high adherence to therapy, and the main aspects related to adherence were advancing age (older patients tend to be more adherent), successful experience with the use of medication therapy, and awareness of the importance of the medicines⁽²⁶⁾.

However, it is worth remembering that individuals with low adherence had difficulties using medication for different morbidities and environmental and social factors⁽²⁶⁾. In addition, corroborating the findings of this study, the use of multiple medications, known as polypharmacy, for the treatment of different morbidities is a barrier to adherence related to mastery of the therapeutic regimen.

Adherence to treatment is essential for disease control, damage prevention, and the success of the proposed therapy. Lack of adherence can lead to complications, hospital admissions, impaired functional independence, falls, compromised quality of life, and reduced life expectancy for older people⁽⁶⁾.

Managing chronic conditions with the use of medication represents a challenge for health professionals, since adherence to drug therapy is generally partial or lower than expected. The main barriers to adherence include: being younger, having a recent diagnosis of morbidity and delays in dispensing medication, concern about dependence on medication, reports of side effects, and difficulties or forgetfulness regarding the use of medicines^(6,26).

Among the main characteristics for the effectiveness of a SAH monitoring program in primary care is regular face-to-face follow-up with health professionals, as this can encourage better adherence to medication, integration of the program with other hospital services and specialized clinics, including appropriate referral of these patients, efficient information management, and identification of patients with failures in SAH control, followed by referral for proper treatment⁽²⁷⁾.

The Comprehensive Geriatric Assessment (CGA) is a multidimensional and multidisciplinary method that makes it possible to identify the clinical, social, and functional conditions of each elderly person, with the aim of drawing up an integrated and coordinated care plan⁽²⁸⁾. This practice has been adopted in different parts of the world⁽²⁸⁾, including in Japan⁽²⁹⁾, as shown in a study that identified a lower proportion of polypharmacy use for patients receiving CGA-based care both on admission and at hospital discharge ($p < 0.001$), compared to those who did not receive this type of care. The most prescribed drugs were anticoagulants and platelet antiaggregants, gastrointestinal drugs, hypotensive drugs, and diuretics. The authors concluded that the use of the CGA favors the early identification of factors related to frailty, polypharmacy, and possible barriers in the context of medication use, directs the care of older people, reduces the number of hospital days required, and reduces mortality⁽²⁹⁾.

By identifying elderly people with cardiovascular, metabolic, and musculoskeletal system morbidities and the therapeutic classes of medication generally used to control these morbidities, nurses will be able to plan and implement actions and interventions to avoid barriers to medication adherence related to the therapeutic regimen, beliefs, and recall.

Health education and the promotion of self-care are fundamental elements in managing adherence and barriers related to polypharmacy. Assertive health education is associated with good metabolic control, helps prevent severe complications associated with polypharmacy in the context of chronic non-communicable diseases, and reduces non-adherence to treatment. The main objective of health education is to promote changes in health behaviors, helping to tackle self-management challenges in everyday life, especially concerning polypharmacy and the different drug classes used⁽⁶⁾.

Health education, with a focus on the risks associated with an ageing population, health care, encouraging healthy behaviors and lifestyles throughout life, following up more than once a year with health professionals, and encouraging group activities with multi-professional teams are strategies to be implemented by health professionals with the aim of enabling adequate adherence to medication, identifying and providing guidance on possible difficulties related to non-adherence and, above all, providing the use of medicines in different drug classes for multiple morbidities. Among the main interventions to manage the proper use of medicines in different therapeutic regimens are advanced and periodic medication reviews, the use of information and communication technologies, medication reconciliation, and constant monitoring of chronic conditions and the use of prescribed medicines⁽⁶⁾.

Although the study contributes to elucidating the relationship between adherence and barriers to adherence to medication and morbidities and classes of drugs, its limitations are that it collected data from a single center, which only cares for patients in the public health system, which may not represent other realities. The cross-sectional study does not allow causality to be established. However, the associations may point to a scenario that contributes to planning screening actions, with the aim of developing strategies that target groups with greater barriers to adherence to the classes of medication used to treat the morbidities presented in this study.

CONCLUSION

The studied older people had predominantly low and medium adherence to the use of medication, as well

as barriers to adherence, particularly in the domains of beliefs and recall. There was a significant association with the use of anti-inflammatory drugs regarding the therapeutic regimen domain. In the domain of beliefs, the barriers were associated with chronic pain morbidity and the use of diuretics and anti-inflammatories. In the recall domain, the barriers were associated with the morbidities SAH, DM2, and dyslipidemia, as well as the use of oral antidiabetic drugs and insulin, proton pump inhibitors, antihypertensives, diuretics, and statins.

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Conflict of interests

None.

Author contributions - CRediT

CRS: conceptualization; data curation; formal analysis; investigation; methodology; project administration; supervision; validation; visualization; writing – original draft; and writing – review and editing.

MFPO: conceptualization; data curation; formal analysis; investigation; methodology; project administration; supervision; validation; visualization; writing – original draft; and writing – review and editing.

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