IMPACTO CIENTÍFICO EDITORA

RISK FACTORS ASSOCIATED WITH DIABETES AND HYPERTENSION IN ELDERLY INDIVIDUALS: AN INTEGRATIVE REVIEW

FATORES DE RISCO ASSOCIADOS AO DIABETES E HIPERTENSÃO EM IDOSOS: REVISÃO INTEGRATIVA

FACTORES DE RIESGO ASOCIADOS CON LA DIABETES Y LA HIPERTENSIÓN EN PERSONAS DE LA TERCERA EDAD: UNA REVISIÓN INTEGRATIVA

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ABSTRACT

Objective: To identify the main risk factors associated with the development of diabetes mellitus and systemic arterial hypertension in the elderly. Methods: An integrative review study was conducted through an electronic search in the MedLine, PubMed, and SciELO databases. The Health Sciences Descriptors used were: risk factor, diabetes mellitus, hypertension, and aged, combined by the Boolean operator "AND." Articles published between 2023 and 2025 were selected. No language restrictions were established to maximize search capacity. Data collection was carried out in July and August 2025. Results: This review consisted of nine studies. The analysis of the studies resulted in three thematic units: 1. Demographic factors; 2. Dietary consumption patterns, obesity, and sedentary lifestyle; 3. Comorbidities, treatment adherence, and polypharmacy. Final considerations: The main risk factors associated with diabetes mellitus and hypertension in the elderly were: advanced age, gender (female), low socioeconomic status, high carbohydrate and animal fat intake, overweight/obesity, metabolic complications (high cholesterol, hypertriglyceridemic waist-to-height ratio), sedentary lifestyle, polypharmacy, and low treatment adherence. This information can support public policies, programs, and goals to reduce hypertension and diabetes, especially in the most vulnerable groups.

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Keywords: Diabetes Mellitus. Aging. Risk Factors. Hypertension. Elderly.

RESUMO

Objetivo: Identificar os principais fatores de riscos associados ao desenvolvimento de diabetes mellitus e hipertensão arterial sistêmica em idosos. Métodos: Estudo de revisão integrativa realizada por meio de busca eletrônica, nos bancos de dados MedLine, PubMed e SciELO. Foram utilizados os Descritores em Ciências da Saúde: fator de risco (risk factor), diabetes mellitus, hipertensão arterial (hypertension) e idoso (aged), combinados pelo operador booleano "AND". Foram selecionados artigos publicados no período de 2023 a 2025. Não foram estabelecidas restrições em relação ao idioma com o intuito de maximizara capacidade de busca. A coleta de dados foi realizada em julho e agosto de 2025. Resultados: Esta revisão foi constituída por nove produções. A análise dos estudos resultou em três unidades temáticas: 1. Fatores demográficos; 2. Padrão de consumo alimentar, obesidade e sedentarismo; 3. Comorbidades, adesão ao tratamento e polifarmácia. Considerações finais: Os principais fatores de riscos associados ao diabetes mellitus e hipertensão arterial em idosos foram: idade avançada, sexo (feminino), baixo nível socioeconômico, alto consumo de carboidratos e de gordura animal, sobrepeso/obesidade, complicações metabólicas (colesterol alto, relação entre cintura-altura hipertrigliceridêmica), sedentarismo, polifarmácia e baixa adesão ao tratamento. Essas informações podem apoiar políticas públicas, programas e metas para reduzir a hipertensão e diabetes, especialmente nos grupos mais vulneráveis.

Palavras-chave: Diabetes Mellitus. Envelhecimento. Fatores de Risco. Hipertensão. Idoso.

RESUMEN

Objetivo: Identificar los principales factores de riesgo asociados al desarrollo de diabetes mellitus e hipertensión arterial sistémica en adultos mayores. Métodos: Se realizó una revisión integrativa mediante una búsqueda electrónica en las bases de datos MedLine, PubMed y SciELO. Los descriptores en Ciencias de la Salud utilizados fueron: factor de riesgo, diabetes mellitus, hipertensión y edad avanzada, combinados mediante el operador booleano "AND". Se seleccionaron artículos publicados entre 2023 y 2025. No se establecieron restricciones de idioma para maximizar la capacidad de búsqueda. La recolección de datos se realizó en julio y agosto de 2025. Resultados: Esta revisión consistió en nueve estudios. El análisis de los estudios resultó en tres unidades temáticas: 1. Factores demográficos; 2. Patrones de consumo alimentario, obesidad y sedentarismo; 3. Comorbilidades, adherencia al tratamiento y polifarmacia. Consideraciones finales: Los principales factores de riesgo asociados con la diabetes mellitus y la hipertensión en adultos mayores fueron: edad avanzada, sexo (femenino), bajo nivel socioeconómico, alto consumo de carbohidratos y grasas animales, sobrepeso/obesidad, complicaciones metabólicas (colesterol alto, índice cintura-talla hipertrigliceridémico), sedentarismo, polifarmacia y baja adherencia al tratamiento. Esta información puede respaldar políticas públicas, programas y objetivos para reducir la hipertensión y la diabetes, especialmente en los grupos más vulnerables.

Palabras clave: Diabetes Mellitus. Envejecimiento. Factores de Riesgo. Hipertensión. Adultos Mayores.

1 INTRODUCTION

Chronic Non-Communicable Diseases (NCDs) are a serious global public health problem, being the main cause of death and premature mortality (before the age of 70), in addition to generating disability, loss of quality of life, especially in the elderly population, and overload on the health and social security systems.[1,2]

NCDs are responsible for 71% of the world's deaths, with an estimated 41 million deaths annually. More than 85% of premature deaths from NCDs are believed to occur in low- and middle-income countries.[3] In 2019, the National Health Survey (PNS) of the Brazilian Ministry of Health indicated that 52% of the adult population (34.3 million people) already had at least one NCD.[4] Reports from the World Health Organization (WHO) indicate that NCDs were responsible for 75% of deaths in Brazil, being the main causes of mortality in the country.[5]

The increase in morbidity and mortality due to these diseases is related to the epidemiological transition and population aging and to the growth of modifiable risk factors. The low quality of life of this population is one of the factors that contribute to the increase in the rates of these diseases, not only that, but also the disparities in access to consumer goods and services, social inequalities, low education and the growth of modifiable risk factors such as smoking, sedentary lifestyle, poor diet and harmful alcohol consumption.[6]

Among NCDs, Diabetes Mellitus (DM) and Systemic Arterial Hypertension (SAH) represent important challenges for public health, due to their complexity, prevalence and the significant impacts they have on society. DM is the leading cause of kidney problems, visual impairment and blindness in several countries. In 2024, the International Diabetes Federation (IDF) describes that 589 million adults (20-79 years) are living with diabetes. If current trends persist, the number of people with diabetes is projected to rise to 12% (853 million) by 2050.[7]

It is worrying to consider the potential growth of DM associated with aging. Risk factors such as age and obesity, both associated with an increase in the number of senescent cells caused by inflammation, fibrosis, and organelle dysfunction (lipotoxicity, mitochondrial, and autophagy), are responsible for the development of diabetes and its complications.[8] According to the Surveillance of Risk and Protective Factors for Chronic Diseases by Telephone Survey (VIGITEL), in 2019, the prevalence of diabetes was 24% for men and 22% for women, aged over 65 years in Brazil.[9]

SAH, in addition to representing an independent and continuous risk factor for cardiovascular disease, the incidence has increased, according to data obtained in population surveys carried out in Brazil, its value varies between 22.3% and 43.9%. In

addition, according to VIGITEL, in the 27 cities of Brazil in 2019, the frequency of diagnosis of arterial hypertension was 52% for men and 61% for women, aged 65 years or older.[9]

Epidemiological studies have associated hypertension with age group (elderly), ethnic group (Afro-descendants), low socioeconomic status, alcohol consumption, smoking, sodium intake, stress, diabetes, obesity, and sedentary lifestyle. Some risk factors (smoking and dyslipidemias) can interact with blood pressure (BP) and increase the risk of cardiovascular disease.[10]

In this context, it is essential to know the distribution and risk factors associated with diabetes and hypertension in the elderly, in order to generate information about the magnitude of the problem, contributing to the planning of actions to control NCDs, aiming to reduce cases of hypertension and diabetes and their possible complications. Thus, the objective of the study was to identify the main risk factors associated with the development of diabetes mellitus and systemic arterial hypertension in the elderly.

2 METHODS

It is an integrative review. The methodological strategy was carried out according to the following steps: 1) identification of the theme and formulation of the research question; 2) establishment of criteria for inclusion and exclusion of studies or literature searches; 3) definition of the information to be extracted from the selected studies; 4) evaluation of the studies included in the integrative review; 5) interpretation of the results; and 6) synthesis of knowledge. It is noteworthy that the integrative review makes it possible, through the combination of studies with different methods, to build a relevant investigation of practice based on scientific evidence.[11]

The guiding question was elaborated through the use of the PVO11 strategy, where P (Population: elderly with hypertension and/or diabetes), V (Variables: risk factors associated with the development of diabetes and hypertension), O (Outcome/Results: studies carried out). Thus, the following guiding question was constructed: "What are the main risk factors associated with the development of diabetes mellitus and systemic arterial hypertension in the elderly?".

The integrative review was performed by means of an electronic search in the MedLine, PubMed, and SciELO databases. The following Health Sciences descriptors were used: risk factor, diabetes mellitus; hypertension; Elderly (aged). The descriptors were combined by the Boolean operator "AND". Only articles published between the years 2023 and 2025 were selected. No language restrictions were established in order to maximize searchability. The exclusion criteria were: theses, dissertations, monographs, review articles,

case reports and those that did not respond to the proposed objective. Data collection was carried out in July and August 2025.

The electronic searches were performed by two independent reviewers (1st selection stage). Subsequently, the suitability of the titles to the objective of the study was evaluated (2nd stage of selection). The abstracts were then read and evaluated (3rd selection stage). All articles whose abstracts met the research criteria were selected for reading in full (4th selection stage).

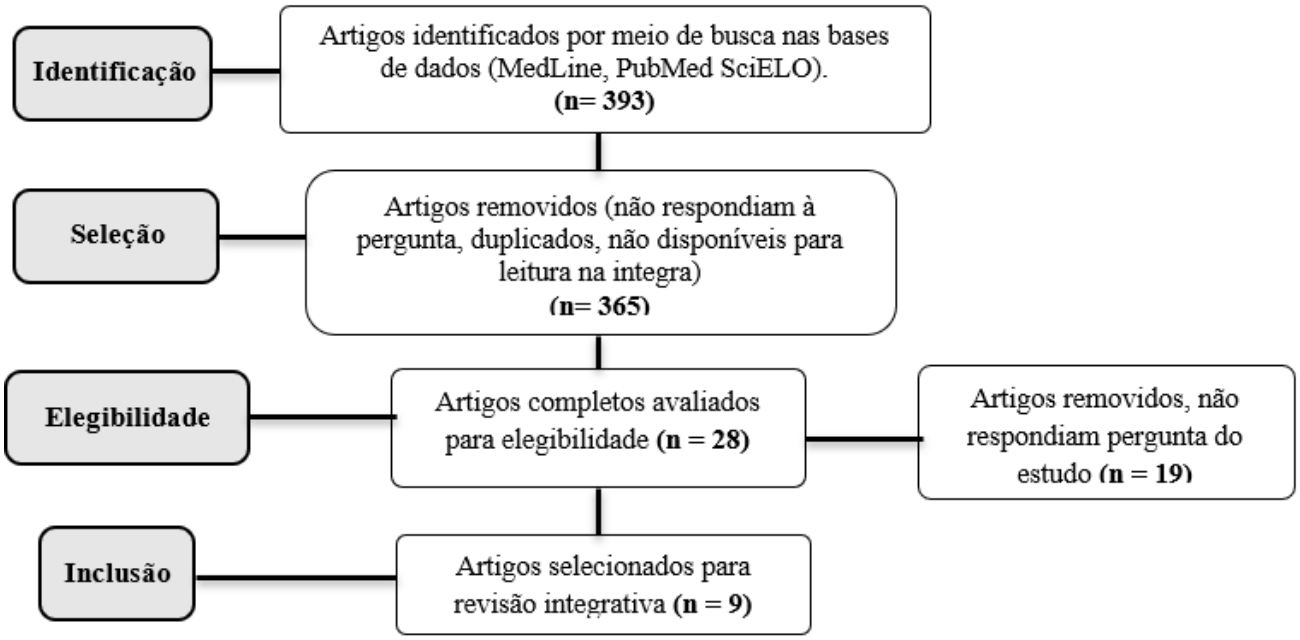
In this systematic review, the results were disseminated based on the guidelines proposed by the Preferred Reporting Items for Systematic Reviews (PRISMA).[12] The study did not require authorization from the Research Ethics Committee, since the data were collected from a digital database in the public domain and comply with nominal confidentiality in accordance with the ethical precepts of Resolution No. 466/12 of the National Health Council.

3 RESULTS

In all, 393 works were found. Of these, 365 were excluded because they did not address the proposed objective, leaving 28 articles and after reading in full, nine were selected for the study (Figure 1). The main risk factors for the development of DM and SAH in the elderly were: age group, gender, obesity, sedentary lifestyle, waist-to-hip ratio, and polypharmacy (use of 5 or more medications).

Figure 1

FlowTable of the selection process of the studies included in the systematic review



Source: Authors, 2025

The data analysis was descriptive, categorizing the data extracted from the selected studies into thematic groups, based on the identification of variables of interest and key concepts, so that the results were categorized in a table adjusted for this purpose containing the following items: author/year, title, type of study, objective and results (Table 1), with the purpose of providing a comparative analysis, so that they would enable the acquisition of answers to the study problem.

Table 1

Selected articles on Diabetes and Hypertension in the elderly, 2023 to 2025

Author Year	Title	Type and place of study. Database	Goal	Findings
E1 Adeniyi et al. 2023.	Prevalence and associated factors of hypertension among type 2 diabetes mellitus patients in Lautech teaching hospital.	Study of secondary data and Transverse Nigeria MedLine PubMed	To assess the prevalence and risk factors of hypertension among patients with type 2 diabetes mellitus attending the University Hospital of Nigeria.	Prevalence of SAH 32%. Hypertension was lower in participants who practiced physical activity. Most consumed carbohydrates (77%), fats (53%), with animal fat the most common (66%). Among hypertensive patients, 48% had high cholesterol, compared with 26% with normal levels.
E2 Silva et al. 2023.	Prevalence of non-communicable chronic diseases: arterial hypertension, diabetes mellitus, and associated risk factors in long-lived elderly people.	Multicenter study Transverse Brazil SciELO	To identify the prevalence of NCDs: hypertension, diabetes mellitus and associated risk factors in long-lived elderly people from three Brazilian regions.	SAH was more common in elderly people who were on polypharmacy (76%), overweight (78%), and metabolic disorder (74%). DM was more prevalent in elderly people aged 80 to 84 years (34%), using polypharmacy (33%), with metabolic risk (30.7%).
E3 Yu N, et al. 2023	Study on the status and influencing factors of comorbidity of hypertension, diabetes, and dyslipidemia among middle-aged and elderly Chinese adults.	Study of secondary data China MedLine PubMed	To analyze the comorbidity status and influencing factors of hypertension, diabetes, and dyslipidemia among middle-aged and older Chinese adults, and to provide support for "co-management of three diseases".	Prevalence of hypertension (46%), DM (19.5%) and dyslipidemia (43%) in the elderly. The rates of SAH/DM comorbidity were 12%, SAH/Dyslipidemia 23%, and DM/Dyslipidemia 11.6%. Rates increase with age, obesity, living in urban areas.
E4 Zhang et al.2023	The relationship between hypertriglyceridemic wait-to-height ratio and hypertension-diabetes comorbidity among older adult.	Cross-sectional study China MedLine PubMed	To investigate the relationship between hypertriglyceridemic waist-height (HTHH) and hypertension-diabetes comorbidities (ADH) in the elderly.	Prevalence of ADH (17%). Older adults with HTHWH have a 2.05-fold higher risk of ADH and the indicator can be used to screen the high-risk population for ADH comorbidity.
E5 Carvalho et al., 2024	Risk factors and prognosis of hypertension and	Cross-sectional study Data collected in DATASUS	To analyze the prevalence of hypertension and diabetes mellitus and	Prevalence of SAH in the elderly 77.4%, SAH/DM 19%, DM 2.6%. The prevalence of SAH/DM and its concomitance was higher in women.

	diabetes: temporal trend analysis.	HIPERDIA. Brazil SciELO	to quantify the risk and prognosis.	Overweight/obesity (34%), sedentary lifestyle (49%) and smoking (21.7%) were observed.
E6 Jobe et al. 2024.	Prevalence of hypertension, diabetes, obesity, multimorbidity, and related risk factors among adult Gambians: a cross-sectional nationwide study.	Cross-sectional study Africa MedLine PubMed	To analyze the prevalence of hypertension, diabetes, obesity, and multimorbidity in older adults in The Gambia.	Prevalence of hypertension increases with age (≥75 years 75%), with overweight/obesity. DM prevalence rose from 6.3% to 9.1% in older adults aged 65-75 years. DM is associated with BMI and low socioeconomic status.
E7 Zhao et al., 2024.	Prevalence and risk factors of diabetes mellitus among elderly patients in the Lugu community.	Cross-sectional study China MedLine PubMed	To investigate the prevalence of diabetes among older adults in the Lugu community and analyze related risk factors to provide a valid scientific basis for the health management of older adults.	Prevalence DM 32.7%. SAH was more prevalent in the DM group (81%) compared to the non-DM group (54%) DM is related to SAH, overweight/obesity, and chronic kidney disease.
E8 Bockarie T et al., 2025.	Cross-sectional study of the association between diet and physical inactivity with obesity, diabetes and hypertension among older adults in Sierra Leone	Cross-sectional study Africa MedLine PubMed	To verify the association between behavioral risk factors (diet, physical activity, and salt intake) and the presence of hypertension, diabetes, and/or obesity.	SAH and DM were associated with urban life**,** advanced age, low consumption of fruits and vegetables, and sedentary lifestyle. DM and obesity were associated with high salt intake and sedentary lifestyle.
E9 Zhang et al.2025	Diabetes Mellitus and Hyperlipidemia Status Among Hypertensive Patients in the Community and Influencing Factors Analysis of Blood Pressure Control	Study of secondary data China MedLine PubMed	To assess the prevalence of T2DM and hyperlipidemia in hypertensive patients in southern China and to assess the relationship between comorbidities and blood pressure control	Association SAH/DM/DISL (12.8%), SAH/DM (12.8%), and SAH/DISL (33%). The elderly, obesity, alcohol abuse, sedentary lifestyle, and poor adherence to medication are associated with greater hypertension.

Source: Authors.

From the analysis of the selected studies and synthesis of the information, three thematic units (UT) emerged, based on the survey of the main factors associated with diabetes mellitus and arterial hypertension in the elderly (Table 2): 1 - Demographic factors (age, gender, income and location/urbanization; 2 - Food consumption pattern, obesity and sedentary lifestyle; 3 - Comorbidities, Adherence to treatment and Polypharmacy.

Table 2

Thematic Units: Risk factors associated with diabetes and hypertension in the elderly

Thematic Units (UT)	Main features	Studies
Demographic factors (age, gender, income, and urbanization).	Elderly people who live in urban areas, with low socioeconomic status, are at higher risk of developing hypertension and diabetes, affecting access to healthy food, health services and, consequently, favoring the adoption of inadequate lifestyle habits.	E2,E3,E5, E6,E8,E9
Food consumption pattern, obesity and sedentary lifestyle.	Low consumption of fruits and vegetables, hyperglycemic, hypersodium and hyperlipidic diet (animal fat), dyslipidemia, overweight/obesity, hypertriglyceridemic waist-height, metabolic disorders, alcohol and sedentary lifestyle.	E1,E2,E3 E4,E5,E6 E7,E8,E9
Comorbidities, adherence to treatment and polypharmacy.	Elderly people with multiple comorbidities who use polypharmacy (use ≥ 5 medications) are at higher risk of developing hypertension and diabetes. Hypertension has a metabolic pathway common to diabetes mellitus, and may occur simultaneously particularly in the presence of obesity, insulin resistance, arterial stiffness, and share the same risk factors. Difficulties in patient adherence to treatment are an important risk factor in elderly patients who undergo polypharmacy.	E2,E3,E5, E7,E9

Source: Authors, 2025.

4 DISCUSSION

4.1 DEMOGRAPHIC FACTORS (AGE, SEX, INCOME AND LOCATION/URBANIZATION)

Socioeconomic factors (such as low level of education and income) and demographic factors (such as population aging, gender, income, and urbanization) impact the prevalence of NCDs by influencing access to health care and living conditions. Social and economic inequalities are directly linked to a higher risk of disease, while better conditions are associated with healthier lifestyle habits and prevention. The analysis of these factors is essential to guide the formulation of effective public policies in health promotion and the protection of vulnerable populations.[13]

As aging grows, it is possible to observe an increase in chronic diseases, which bring even more limitations to affected individuals, such as impairments in the execution of basic daily activities and significant loss in quality of life, requiring extension of care, especially those who are older.[14-17] In addition, the deterioration of physical functions leads to a reduction in the frequency and intensity of daily physical activities, which negatively affects blood pressure control.[18]

The results of this study indicate that as the person ages, the occurrence of hypertension and/or diabetes increases, demonstrating a proportional relationship between age and the presence of diseases. The study conducted with elderly recruited from family homes, long-term care institutions and geriatrics outpatient clinics in three Brazilian regions: Taguatinga (DF) with 196 elderly people, Passo Fundo (RS) with 272 elderly people and Campinas (SP) with 232 elderly people, found a mean age of 85.7 years, 73% of whom were women, and found a prevalence of 13% hypertensive and 26% diabetes. DM was more prevalent in elderly people aged 80 to 84 years (34%).[16]

Similarly, the study carried out in villages around Lake Lugu, in the provinces of Sichuan and Yunnan, in southwest China, corroborates these findings, in their work they studied 4,516 elderly people and found a prevalence of 33% DM. The age of the patients in the DM group ranged from 65 to 81 years.[19]

A study carried out in The Gambia-West Africa with 9,188 adults and the elderly, found a prevalence of 47% SAH (95% CI 45.6–48.5) significantly higher in women and in urban areas; an increase in the prevalence of hypertension in relation to age, increasing from 30% (35 and 45 years) to 75% (over 75 years). The prevalence was 6.3% of DM, being higher in women 7% (6.3-7.7) and in 9% elderly (65 to 75 years). DM was associated with low socioeconomic status. The occurrence of multimorbidity was 10.7% (9.9-11.5) and more prevalent in women, affecting 19.7% (18-21.5) in urban areas.[15]

The comorbidity status and influencing factors of hypertension, diabetes, and dyslipidemia in 134,950 middle-aged and elderly Chinese adults were investigated through secondary data from the National Surveillance of Chronic Diseases and Risk Factors in China in 2018. The prevalence of hypertension was 46% (95% CI: 45.1% to 47.0%) and DM 19.5% (95% CI: 18.7% to 20.2%). The rates increased with age and residing in urban areas.[17]

A cross-sectional study conducted with 1,978 adults and elderly people in Sierra Leone-Africa, with the objective of verifying the association between behavioral risk factors (diet, physical activity and salt intake) and the presence of hypertension, diabetes and/or obesity, found that at least one risk factor for cardiovascular diseases, i.e., hypertension, obesity or diabetes, was present in 44% of the participants. Hypertension was associated with urban life (OR=1.46, 95% CI: 1.41 to 1.51), advanced age (OR for ≥80 = 3.98, 95% CI: 3.70 to 4.28). DM was associated with urban residence (OR=1.84, 95% CI: 1.66 to 2.05), advanced age (OR for 70-79 = 3.82, 95% CI: 3.28 to 4.45). Obesity was associated with urban life (OR=1.66, 95% CI: 1.59 to 1.72).[14]

4.2 RISK FACTORS RELATED TO FOOD CONSUMPTION PATTERN, OBESITY AND SEDENTARY LIFESTYLE

According to the WHO2, inadequate lifestyles, such as a sedentary lifestyle, unhealthy diet, smoking, and excessive alcohol consumption, are closely linked to the development of chronic diseases, such as DM and SAH, which are more common in old age. DM has risk factors such as dyslipidemia, obesity, smoking, and a high-sugar diet, whereas SAH shares these factors but is especially influenced by the high-salt, high-fat diet.

Overweight and obesity contribute to BP elevation through multiple mechanisms, including renal dysfunction due to kidney compression and activation of the renin-

angiotensin-androsterone system (RAAS), hyperinsulinemia that increases sympathetic tone and renal sodium reabsorption, obstructive sleep apnea, leptin-melanocortin pathway dysfunction, and genetic susceptibility factors.[20] Excess body fat promotes a state of chronic inflammation and dysregulates metabolism, which raises BP, hinders insulin action, and increases the risk of heart disease, stroke, and type 2 diabetes.[8]

Metabolic syndrome is a set of conditions that often coexist and include SAH, hyperglycemia, dyslipidemia, and abdominal obesity. These components are not only symptomatically related, but also share underlying pathophysiological mechanisms. In patients with SAH and DM, insulin resistance can lead to increased BP and impaired glucose metabolism. In addition, the dysregulation of lipid metabolism seen in hyperlipidemia often coexists with SAH and diabetes, further exacerbating the risk of cardiovascular disease. Obesity, in particular abdominal obesity, is strongly associated with the development of SAH, diabetes, and dyslipidemia. Excess adipose tissue releases pro-inflammatory cytokines and adipokines that can disrupt normal metabolic processes and contribute to the development of these comorbidities.[18]

Corroborating the literature, a study17 conducted in China showed that overweight/obesity, excessive alcohol consumption, physical inactivity, time of daily sedentary behavior ≥ 5 hours and sleep duration < 7 hours were risk factors for the comorbidity of SAH/DM/Dyslipidemia. Silva et al.[16] found that hypertension was more common in overweight elderly (78%), with risk of metabolic complications (74%); and DM was more prevalent in elderly with metabolic risk (31%).

A study conducted with 3,501 elderly people in Henan-China to explore the relationship between hypertriglyceridemic waist-height (HTHWH) and hypertension/diabetes (HAD), found a mean age of 69.9 years. A total of 1,207 (34%) individuals were in the HTHWH group, and the prevalence rate of ADH was 17% in this group. Multivariate logistic regression analysis showed that, compared with the normal group, the risk of ADH in the HTHWH group increases by 2.05-fold (OR = 3.05, 95% CI: 2.06-4.51).[21]

Similarly, the study by Zhao et al.[19], found that the Body Mass Index (BMI) was higher in the DM group (25.16 ± 3.35) than in the non-DM group (24.61 ± 3.78). However, there was no significant difference in the waist-to-hip ratio, contrary to the literature. Hypertension was more prevalent in the DM group (81%) compared to the non-DM group (54%). The DM group had higher alcohol consumption.

Jobe et al.[15] found an increase in the prevalence of hypertension in overweight or obese people, in both sexes. More than a third of the sample (36.6%) was overweight (24.6%)

or obese (12%). The most common combination was SAH/obesity in 7.2% (6.6-7.9) increasing to 12.2% (11.1-13.3) in women.

In the study by Bockarie et al.[14], hypertension was associated with insufficient consumption of fruits and vegetables (OR = 1.52, 95% CI (1.46 to 1.60) and low physical activity (OR = 1.35, 95% CI (1.27 to 1.43). DM was associated with low fruit and vegetable intake (OR=1.61, 95% CI (1.36 to 1.90), high salt intake (OR=1.34, 95% CI (1.21 to 1.49), and sedentary lifestyle (OR=1.47, 95% CI (1.26 to 1.71). Obesity was associated with high salt intake (OR=1.21, 95% CI (1.17 to 1.25) and sedentary lifestyle (OR=1.30, 95% CI (1.22 to 1.39).

4.3 COMORBIDITIES, ADHERENCE TO TREATMENT AND POLYPHARMACY

The results of this review indicate that the occurrence of risk factors associated with multiple chronic pathological processes can generate complications and problems that reduce the survival of the elderly population16-19

Cardiometabolic conditions include cardiac dysfunctions (history of stiffening of the arteries, atherosclerosis, arterial or venous insufficiency, heart failure) and diabetes (blood glucotoxicity, diabetic neuropathy, diabetic foot, diabetic retinopathy, kidney injury). Among the pathological processes that affect the neurological system are Cerebrovascular Accident (CVA), dementia, cognitive impairment conditions and neuropsychiatric disorders.[2]

In addition, elderly people with multiple comorbidities usually use polypharmacy (≥ 5 medications), have a higher risk of developing hypertension and diabetes. SAH has a metabolic pathway common to DM, and can occur simultaneously, particularly in the presence of obesity, insulin resistance, arterial stiffness, and share the same risk factors. The coexistence of these two diseases in the same elderly individual is no coincidence, particularly in the presence of obesity, insulin resistance, and arterial stiffness.[22]

Regarding the simultaneous occurrence between DM/SAH, the study by Yu et al.[17] identified an association between SAH/DM 12%, SAH/Dyslipidemia 23% and DM/Dyslipidemia 11.6%. Zhao et al.[19], also found an association between SAH/DM, hypertension was more prevalent in the DM group (81%) compared to the non-DM group (54%). The DM group had more cases of heart and kidney disease.

Similar studies have shown a direct association between the presence of complications associated with DM and SAH, which impair the quality of life of affected individuals. This factor is mainly related to the long duration of the disease and incorrect treatment, with repercussions in cases of hospitalization and more serious situations, and may even lead to death.[18.23]

Because they are a multifactorial chronic disease, several factors can contribute to poor BP control: treatment failures (incorrect dosage or clinical inertia), barriers to access to health care (lack of health insurance or sporadic contact with the health system), and difficulties in patient adherence to treatment and lifestyle recommendations, such as poor diet or lack of exercise.[24]

The WHO25 defines adherence as the extent to which a person's behavior—taking medications, following a diet, or implementing lifestyle changes—matches the recommendations agreed upon by a health professional. While all of these health behaviors are important, medication adherence plays a specific and critical role in controlling hypertension, especially for older adults on polypharmacy.

Regarding polypharmacy, the study by Silva et al.[16] found that SAH was more common in elderly people who were undergoing polypharmacy (76%) and with metabolic disorders (74%). DM was more prevalent in elderly people using polypharmacy (33%), with metabolic risk (31%).

Corroborating the literature, a study18 carried out with hypertensive patients in southern China, with the objective of evaluating the prevalence of DM and hyperlipidemia and the relationship between these comorbidities, found a mean age of 72.2 ± 9.6 years; association of 12% between SAH/DM in 12%, and 33.5% SAH/hyperlipidemia. The mean duration of SAH of 11.3 ± 8 years, age ≥ 60 years, overweight, obesity, alcohol consumption, low adherence to medication, and non-adherence to medication were risk factors for SAH control, regardless of the presence or absence of complications of diabetes and hyperlipidemia.

Therefore, the coexistence of risk factors for diabetes and hypertension requires close health monitoring, including early diagnosis and adherence to treatments, which combine medication and lifestyle changes. In addition, it is crucial to evaluate the effectiveness of public health policies to control these chronic diseases, promoting access to health services, healthy eating, physical activity, and educational programs to reduce the incidence and impact of these conditions on the vulnerable population.[26]

Among the limitations of this review are the quality and bias of the primary studies, the heterogeneity between the studies, the difficulty in finding all the relevant literature (search bias), and the time and resources required to carry it out.

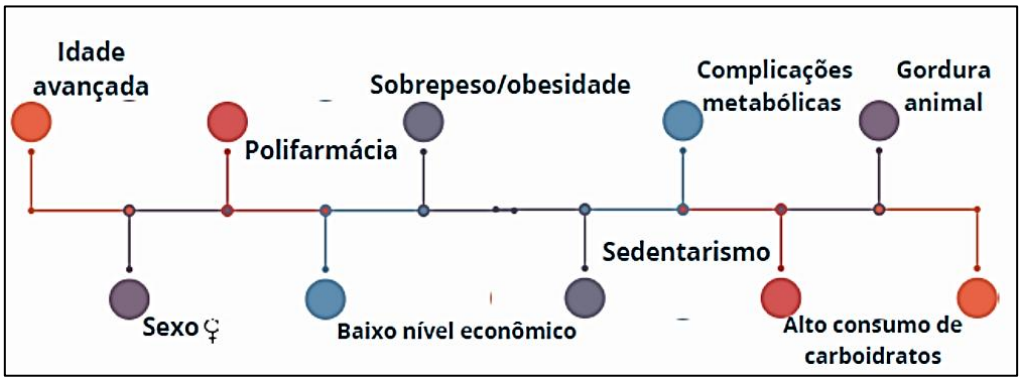
5 FINAL CONSIDERATIONS

The review found that the main risk factors associated with the development of diabetes mellitus and hypertension in the elderly were: advanced age, gender (female),

polypharmacy, low socioeconomic status, overweight/obesity, sedentary lifestyle, metabolic complications (high cholesterol, hypertriglyceridemic waist-to-height ratio), high consumption of carbohydrates and animal fat, Figure 2. The understanding of these risk factors demonstrates the need for prevention and management strategies aimed at reducing the impacts of these comorbidities in the elderly population, aiming to improve quality of life and reduce associated complications.

Figure 2

Synthesis of the main risk factors associated with the development of diabetes mellitus and systemic arterial hypertension in the elderly



Source: Authors, 2025.

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