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Markers of dietary intake and central adiposity in older adults with hypertension and/or diabetes followed in primary health care

Marcadores de consumo alimentar e adiposidade central em pessoas idosas com hipertensão e/ou diabetes acompanhadas na Atenção Primária à Saúde

Marcadores del consumo alimentario y adiposidad central en personas mayores con hipertensión y/o diabetes atendidas en atención primaria de salud

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Abstract: This study aimed to analyze dietary intake markers and central adiposity in older adults with systemic arterial hypertension (SAH) and/or diabetes mellitus (DM) who are monitored within the Primary Health Care system. This is a quantitative, observational, cross-sectional study using non-probabilistic sampling, conducted at a Family Health Unit in Patos, Paraíba. Data collection involved a semi-structured questionnaire for sociodemographic information, the dietary intake markers instrument from the Food and Nutrition Surveillance System (SISVAN), and anthropometric assessment (waist and hip circumferences). The waist-to-hip ratio (WHR) was classified according to sex-specific cut-off points (≥ 0.85 for women and ≥ 0.90 for men). Data were analyzed descriptively using absolute and relative frequencies, means, and standard deviations. A total of 105 older adults participated, 78.1% of whom were women. SAH alone was the most frequent condition (59.0%), followed by SAH combined with DM (34.3%) and DM alone (6.7%). Regarding dietary intake on the previous day, 79.0% of participants reported consuming beans, 84.8% fresh fruits, and 57.1% vegetables and greens; 69.5% reported consuming sweetened beverages, 41.9% instant noodles, savory snacks, or crackers, and 48.6% filled cookies, sweets, or treats. An elevated WHR was observed in 92.4% of the sample, with a mean value of 0.966 (SD = 0.091) and a frequency exceeding 90% across all clinical conditions. Older adults exhibited both favorable dietary markers and a significant intake of sugar-sweetened beverages and ultra-processed foods, alongside a high prevalence of central adiposity. As this was a descriptive analysis, it was not possible to establish an association between diet and the waist-to-hip ratio (WHR). These findings underscore the importance of dietary and anthropometric monitoring in the primary healthcare of older adults living with chronic diseases.

Keywords:
Aged; Hypertension; Diabetes Mellitus; Food Consumption; Waist-Hip Ratio; Primary Health Care.

Resumo: Este estudo teve por objetivo analisar os marcadores de consumo alimentar e a adiposidade central em pessoas idosas com hipertensão arterial sistêmica e/ou diabetes mellitus acompanhadas na Atenção Primária à Saúde. Trata-se de pesquisa quantitativa, observacional e transversal, com amostragem não probabilística, realizada em uma Unidade de Saúde da Família de Patos, Paraíba. Foram aplicados questionário semiestruturado com dados sociodemográficos, o instrumento de marcadores de consumo alimentar do Sistema de Vigilância Alimentar e Nutricional (SISVAN) e avaliação antropométrica (circunferências da cintura e do quadril). A RCQ foi classificada segundo pontos de corte por sexo (≥ 0,85 para mulheres e ≥ 0,90 para homens), e os dados foram analisados de forma descritiva, por

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frequências absolutas e relativas, médias e desvios-padrão. Participaram 105 pessoas idosas, das quais 78,1% eram mulheres. A HAS isolada foi a condição mais frequente (59,0%), seguida de HAS associada ao DM (34,3%) e DM isolado (6,7%). Quanto aos marcadores do dia anterior, 79,0% relataram consumo de feijão, 84,8% de frutas frescas e 57,1% de verduras e legumes; 69,5% referiram bebidas adoçadas, 41,9% macarrão instantâneo, salgadinhos ou biscoitos salgados e 48,6% biscoitos recheados, doces ou guloseimas. Observou-se RCQ elevada em 92,4% da amostra, com média de 0,966 (DP = 0,091) e frequência acima de 90% em todas as condições clínicas. As pessoas idosas apresentaram, simultaneamente, marcadores alimentares favoráveis e consumo expressivo de bebidas adoçadas e ultraprocessados, em um contexto de elevada frequência de adiposidade central. Por se tratar de análise descritiva, não foi possível estabelecer associação entre alimentação e RCQ. Os achados reforçam a pertinência da vigilância alimentar e antropométrica no cuidado à pessoa idosa portadora de doenças crônicas na Atenção Primária à Saúde.

Palavras-chave:
Pessoa Idosa; Hipertensão; Diabetes Mellitus; Consumo de Alimentos; Relação Cintura-Quadril; Atenção Primária à Saúde.

Resumen: El objetivo del estudio fue analizar los marcadores del consumo alimentario y la adiposidad central en personas mayores con hipertensión arterial sistémica (HAS) y/o diabetes mellitus (DM) atendidas en atención primaria de salud. Se realizó un estudio cuantitativo, observacional y transversal, con muestreo no probabilístico, en una Unidad de Salud de la Familia de Patos, Paraíba. Se aplicaron un cuestionario sociodemográfico semiestructurado, el instrumento de marcadores del consumo alimentario del Sistema de Vigilancia Alimentaria y Nutricional (SISVAN) y una evaluación antropométrica (perímetros de cintura y cadera). El índice cintura-cadera (ICC) se clasificó por sexo (≥0,85 en mujeres y ≥0,90 en hombres). El análisis descriptivo incluyó frecuencias absolutas y relativas, medias y desviaciones estándar. Participaron 105 personas mayores (78,1 % mujeres). La HAS aislada fue la condición más frecuente (59,0 %), seguida de la HAS con DM (34,3 %) y la DM aislada (6,7 %). El día anterior, el 79,0 % consumió frijoles, el 84,8 % frutas frescas y el 57,1 % verduras y hortalizas. El 69,5 % consumió bebidas azucaradas; el 41,9 %, fideos instantáneos, aperitivos o galletas saladas; y el 48,6 %, galletas rellenas, dulces o golosinas. El 92,4 % presentó ICC elevado (media: 0,966; DE: 0,091), con frecuencias superiores al 90 % en todas las condiciones clínicas. Coexistieron marcadores favorables, un consumo considerable de bebidas azucaradas y ultraprocesados y una alta frecuencia de adiposidad central. El análisis descriptivo no permitió establecer una asociación entre alimentación e ICC. Los hallazgos respaldan la vigilancia alimentaria y antropométrica de personas mayores con enfermedades crónicas en atención primaria.

Palabras clave:
Persona Mayor; Hipertensión; Diabetes Mellitus; Consumo de Alimentos; Índice Cintura-Cadera; Atención Primaria de Salud.

1. Introduction

Brazil's population is ageing rapidly as a result of demographic changes that began in the 1950s and 1960s. This phenomenon involves more than an increase in the number of older people. It encompasses social, regional, and structural changes that directly affect how health

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services are organized and the distribution of disease in the population (Faria; Spode, 2024).

Ageing is a natural, continuous process that takes place throughout life. As life expectancy rises, it is increasingly important to understand the characteristics of later life and their effects on health (Corrêa; Veríssimo, 2025). In this context, chronic noncommunicable diseases (NCDs), particularly systemic arterial hypertension (SAH) and diabetes mellitus (DM), become more common and are important risk factors for cardiovascular complications.

As the population ages, Brazilian dietary patterns are also changing. Consumption of ultra-processed foods has increased substantially, including among groups that previously consumed fewer of these products, indicating that this type of diet is becoming more widespread across the country (Louzada et al., 2023).

These changes are associated with the consolidation of a Western dietary pattern, marked by higher consumption of sugars, alcoholic beverages, and foods of low nutritional value. Over time, this pattern has contributed to rising obesity, a major risk factor for cardiovascular disease associated with lower quality of life and higher healthcare costs (Nepomuceno; Pereira; Simões, 2025).

Studies indicate that a substantial proportion of Brazilian adults are at high risk of coronary events over the coming years, especially when risk factors are not adequately controlled (Silva, P. G. et al., 2023). Among older adults with hypertension and diabetes, the risk tends to be even higher because of the coexistence of multiple clinical conditions.

Recent analyses also show that several health indicators have worsened among older adults, including increases in the prevalence of diabetes, alcohol consumption, excess weight, and obesity (Silva, A. G. et al., 2023). These factors directly contribute to higher cardiovascular risk.

Unhealthy behaviours such as smoking and excessive alcohol consumption are also associated with higher levels of cardiovascular risk factors, including hypercholesterolemia and obesity, illustrating the central role of lifestyle in cardiovascular health (Gonçalves et al., 2024).

In addition, abnormal levels of total cholesterol and its fractions are common in Brazil, especially among older adults and people with less education. This highlights the importance of strategies that promote healthy eating and physical activity and improve chronic disease control (Malta et al., 2019).

In this context, it is relevant to analyze dietary intake markers and central adiposity in older adults with systemic arterial hypertension and/or diabetes mellitus followed in primary health care. Given the population's dietary profile, the rise in chronic disease, and the high

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burden of cardiovascular risk factors in this age group, understanding this relationship may help primary health care plan more effective measures to prevent cardiovascular events. The study therefore asks how the dietary patterns of older adults with hypertension and diabetes might influence cardiovascular risk in this population.

2 Theoretical framework

2.1 Population ageing and chronic noncommunicable diseases

Brazil is undergoing a rapid demographic transition marked by a substantial increase in the older population due to declining fertility and rising life expectancy. This phenomenon is more pronounced in developing countries and has important social and economic implications and consequences for health systems. The older population is growing faster than the total population and therefore accounts for a larger share of it over time (Brito, 2008; Travassos; Coelho; Arends-Kuenning, 2020).

Population ageing is directly linked to increased demand for health services. It calls for changes to public policies and the organization of care, particularly the provision of continuous and comprehensive care to older adults. Strengthening universal health systems and expanding access to services are therefore essential to safeguarding equity and quality of life for older people (Miranda; Mendes; Silva, 2016).

Alongside population ageing, chronic noncommunicable diseases (NCDs) are becoming more prevalent and constitute a major public health challenge. Older adults tend to have multiple chronic conditions, often associated with functional limitations and greater dependence. Recent evidence also suggests that they may develop these diseases earlier and experience a greater impact on functional capacity, highlighting the need to promote active ageing and strengthen health literacy (Zhang et al., 2022).

Although ageing is natural, it is influenced by biological, genetic, nutritional, and environmental factors, making it dynamic and amenable to change. Studies suggest that both intrinsic factors and external conditions, including lifestyle and diet, affect longevity and the occurrence of age-related diseases, and can accelerate or slow this process (Chmielewski et al., 2024).

Major NCD risk factors include hypertension, smoking, unhealthy diets, excess weight, and abnormal blood glucose levels. Projections indicate that these factors, particularly obesity, physical inactivity, and poor diet, will increase substantially by 2050, potentially compromising

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global targets for reducing premature mortality from chronic diseases (Malta et al., 2026).

Obesity is considered a global epidemic and is one of the major public health problems of our time. Its associations with chronic conditions such as diabetes mellitus, cardiovascular disease, musculoskeletal disorders, and some cancers show its effect on morbidity and mortality, especially in older adults (Ramos et al., 2025).

Brazilian studies also report a high prevalence of changes in body composition among older adults, such as abdominal fat accumulation, often associated with declining muscle strength (dynapenia). This combination increases the risk of disability and adverse health events. It is more prevalent among women and in older age groups, with substantial regional variation across Brazil (Oliveira et al., 2025).

Population ageing is thus closely associated with increases in NCDs and their risk factors. This complex situation calls for integrated efforts to promote health, prevent adverse outcomes, and reorganize health services. Understanding these changes is essential to developing strategies that support both longer lives and better quality of life for older adults.

2.2 Dietary patterns and the nutrition transition

The nutrition transition consists of gradual changes in dietary patterns and population health profiles, shaped by social, economic, and cultural change. Traditional eating practices are being replaced by a Westernized dietary pattern characterized by increased consumption of ultra-processed foods, added sugars, and alcoholic beverages. This shift has been associated with deteriorating diet quality over time and a growing intake of foods with low nutritional value that can harm health (Nepomuceno; Pereira; Simões, 2025).

Studies also show that the Western dietary pattern has spread across regions and populations. This expansion reflects globalization and the industrialization of food systems, which make processed and ultra-processed products widely available. Analysis of these patterns shows that their adoption is directly associated with higher obesity prevalence. Obesity is an important risk factor for cardiovascular disease and is associated with poorer quality of life, a higher risk of premature death, and greater costs for health systems (Nepomuceno; Pereira; Simões, 2025).

Consumption of ultra-processed foods (UPFs) is a major marker of the current nutrition transition. Among older adults in Brazil, it has been associated with higher educational attainment, residence in more developed regions and urban areas, and sedentary behaviours such as prolonged television viewing. These findings show that UPF consumption occurs across

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income groups and population segments, reflecting changes in lifestyle and the food environment (Riva et al., 2025).

At the same time, intake of foods considered protective, such as fruits and vegetables, has fallen. The reduction was more pronounced among men, younger adults, and people with higher educational attainment, indicating a move away from dietary recommendations. This trend reinforces the need to strengthen healthy eating promotion and dietary surveillance (Veiga et al., 2025).

Another concern is inadequate intake of essential nutrients such as protein, particularly among older adults. Studies associate low protein intake with a higher risk of mortality, underscoring protein's role in maintaining lean body mass and preventing adverse outcomes in older age. Adequate protein intake is therefore important for health and longevity in this group (Souza et al., 2024).

In Brazil, the nutrition transition is also evident in trends in anthropometric indicators over recent decades. Evidence shows that underweight is no longer a predominant problem among adults, while obesity has been rising since the 1970s. This increase varies across socioeconomic groups and is steeper among lower-income populations. Obesity is also more prevalent among women, highlighting the influence of social, economic, and biological factors (Conde; Silva; Ferraz, 2022).

2.3 Cardiovascular risk and its relationship to diet among older adults with hypertension and diabetes

Cardiovascular risk among older adults is strongly associated with chronic noncommunicable diseases, particularly hypertension and diabetes mellitus, which are among the leading contributors to rising mortality worldwide. These conditions have interrelated pathophysiological mechanisms that contribute to declining health. In diabetes, inadequate glycemic control promotes the formation of advanced glycation end products (AGEs), which interact with their receptors and promote inflammation, arterial stiffness, and endothelial dysfunction. These changes promote the development of hypertension and increase the risk of cardiovascular complications, underscoring the need for strategies to improve metabolic control and protect vascular health (Fuhr et al., 2022).

Hypertension is among the most prevalent conditions in older Brazilians, affecting more than half of this population. Several factors contribute to elevated blood pressure, including unhealthy eating habits. Excessive sodium intake, frequent consumption of high-fat foods and

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alcoholic beverages, and low intake of fruits and vegetables are directly associated with poor blood pressure control. Obesity is an additional aggravating factor that further increases cardiovascular risk in this population (Reis et al., 2022).

Hypertension combined with other risk factors, such as diabetes mellitus and metabolic syndrome, further increases cardiovascular risk. Studies show a high prevalence of metabolic syndrome among older adults with hypertension. The syndrome substantially increases the probability of cardiovascular events. Advanced age, physical inactivity, female sex, and changes in clinical and biochemical parameters compound this risk, emphasizing the need for comprehensive care for older adults (Costa et al., 2021).

In addition to clinical factors, diet plays a fundamental role in determining cardiovascular risk. Greater consumption of ultra-processed foods has been associated with adverse outcomes such as heart failure. Evidence suggests that older adults with higher intake are substantially more likely to develop this condition, especially when they consume products from multiple ultra-processed food groups. These products are generally high in sodium, sugar, and poor-quality fats, which can aggravate hypertension and diabetes and adversely affect cardiovascular health (Ribeiro et al., 2024).

Interactions among metabolic, behavioural, and dietary factors are reflected in the higher incidence of cardiovascular events among older adults. Acute myocardial infarction, for example, is relatively prevalent in this group and strongly associated with multiple risk factors, including hypertension, diabetes, hypercholesterolemia, obesity, and chronic kidney disease. These factors substantially increase the probability of myocardial infarction, contribute to poorer quality of life, and increase mortality (Bertelli et al., 2025).

3. Materials and methods

This quantitative, cross-sectional, observational field study was designed to characterize dietary intake markers and central adiposity in older adults with systemic arterial hypertension (SAH) and/or diabetes mellitus (DM) receiving primary health care.

The research was conducted at a Family Health Unit (FHU) in Patos, Paraíba. Participants were approached at the unit, where researchers explained the study objectives and carried out the data collection procedures, including administering the instruments and performing anthropometric assessments.

The sample consisted of older adults who fulfilled the inclusion criteria. They were selected using nonprobability convenience sampling based on their availability and willingness

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to participate.

Eligible participants were older adults of both sexes who had a diagnosis of systemic arterial hypertension and/or diabetes mellitus, were registered with and followed by the Family Health Unit, and could answer the questionnaires and undergo the proposed assessments after signing the informed consent form (ICF).

Individuals with cognitive or communication limitations that prevented them from understanding the questions or participating adequately in data collection were excluded.

Data were collected using a semi-structured questionnaire with closed-ended questions about sociodemographic characteristics, including age and sex, and questions about dietary intake markers.

Dietary intake was assessed using the dietary intake markers instrument to identify foods and food groups consumed by the participants.

The anthropometric assessment involved measuring waist and hip circumferences with a nonstretch tape. The waist-to-hip ratio (WHR) derived from these measurements was used to assess central adiposity.

The data were organized in spreadsheets and analyzed in Microsoft Excel®. Descriptive analysis summarized categorical variables using absolute and relative frequencies (n and %) and numerical variables using measures of central tendency and dispersion, as appropriate.

The results were presented in tables to aid interpretation. They were then discussed in light of the relevant scientific literature, taking into account the participants' dietary intake markers, clinical conditions, and central adiposity.

The study was submitted to the Research Ethics Committee of the Centro Universitário de Ensino Superior de Patos (UNIFIP) and approved under Certificate of Submission for Ethical Review (CAAE) No. 8.558.682. The Patos Municipal Health Department in Paraíba also gave prior authorization for the research.

The study followed the ethical principles established in Brazilian National Health Council Resolutions No. 510/2016 and No. 580/2018. All participants were informed of the study objectives, procedures, possible risks, and benefits. Participation was voluntary and required a signed informed consent form.

Anonymity and confidentiality were ensured, and the data were used exclusively for scientific purposes. Participants could withdraw at any time without penalty.

The research posed minimal risks because it involved questionnaires and noninvasive anthropometric measurements. Possible discomfort included embarrassment when answering

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certain questions or discomfort during body measurements.

To minimize these risks, data were collected in a private setting to protect participant privacy and confidentiality. Individuals could decline to answer any question or end their participation at any time. If discomfort was observed, data collection would stop and, if necessary, the participant would be directed to seek care at the Family Health Unit.

Indirect benefits may include greater participant awareness of the importance of healthy eating and of monitoring factors that affect cardiovascular health. The findings may also inform primary health care strategies for health promotion and disease prevention, particularly among older adults with systemic arterial hypertension and/or diabetes mellitus, thereby strengthening care and improving quality of life.

4. Results and discussion

The study included 105 older adults with systemic arterial hypertension (SAH) and/or diabetes mellitus (DM) who were followed at a Family Health Unit in Patos, Paraíba. Among self-reported clinical conditions, SAH alone was the most common (59.0%; n = 62), followed by SAH with DM (34.3%; n = 36). DM alone was reported by only 6.7% (n = 7) of the participants (Table 1).

Table 1 – Distribution of self-reported clinical conditions (n=105)

Clinical condition	**n**	**%**
SAH	62	59,%
DM	7	6.7%
SAH/DM	36	6.7%

Source: Research data

SAH predominated and was present alone or with DM in 93.3% of the older adults (n = 98). More than one third of the sample lived with both conditions, indicating multimorbidity and more complex care needs.

SAH and DM require continuous monitoring and are associated with modifiable factors, including an unhealthy diet, excessive sodium intake, physical inactivity, and excess body fat. This is consistent with Oliveira-Figueiredo et al. (2024), who reported that more than half of older Brazilians have two or more chronic conditions, making multimorbidity a major public health concern. They identified advanced age, lower educational attainment, and insufficient physical activity as associated factors and highlighted the role of primary health care in providing comprehensive, individualized care. The high proportion of participants with both

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conditions reinforces the need for nutrition education and multidisciplinary follow-up in primary health care.

Regarding mealtime behaviour, 74.3% (n = 78) reported that they did not routinely eat while watching television or using a computer or mobile phone, whereas 25.7% (n = 27) reported doing so (Table 2). This practice was reported by about one quarter of the sample.

Table 2 – Screen use during meals (n=105)

Screen use	**n**	**%**
Yes	27	25.7%
No	78	74.3%

Source: Research data

Eating in front of screens draws attention away from the meal and has been associated with longer eating episodes and more total time spent eating throughout the day. Because energy intake was not assessed directly, these findings indicate only that distractions during meals may affect eating behaviour (Alblas et al., 2023). The proportion observed warrants attention in nutrition education, which can encourage mindful eating and attention to meals.

All participants (100.0%) reported eating breakfast and lunch. Dinner was reported by 92.4%, an afternoon snack by 70.5%, and a morning snack by 47.6%. A late-evening snack was least common, reported by only 14.3% of participants (Table 3).

Table 3 – Frequency of daily meals and snacks

Variable	**n**	**%**
Breakfast		
Yes	105	100%
No	0	0.0%
Morning snack		
Yes	50	47.6%
No	55	52.4%
Lunch		
Yes	105	100%
No	0	0.0%
Afternoon snack		
Yes	74	70.5%
No	31	29.5%
Dinner		
Yes	97	92.4%
No	8	7.6%

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Variable	n	%
Late-evening snack		
Yes	15	14.3%
No	90	85.7%

Source: Research data

Overall, participants averaged approximately four eating occasions per day. Main meals (breakfast, lunch, and dinner) were more frequent than morning, afternoon, or late-evening snacks. This pattern is consistent with the literature linking meal frequency to sociodemographic factors such as sex, education, and economic circumstances. Eating practices also reflect social conditions and access to food. Social vulnerability and food and nutrition security should therefore be considered when planning interventions for older adults (Karpinski et al., 2021).

Table 4 presents the dietary intake markers for the day before the interview. The percentages describe reported consumption on that day, without quantifying portion sizes or characterizing usual intake.

Table 4 – Dietary intake markers for the day before the interview

Dietary intake marker	n	%
Beans		
Yes	83	79.0%
No	22	21.0%
Fresh fruit (excluding juice)		
Yes	89	84.8%
No	16	15.2%
Vegetables and greens (excluding tubers)		
Yes	60	57.1%
No	45	42.9%
Hamburgers/processed meats		
Yes	11	10.5%
No	94	89.5%
Sweetened beverages		
Yes	73	69.5%
No	32	30.5%
Instant noodles/savoury snacks/crackers		
Yes	44	41.9%
No	61	58.1%
Filled cookies/sweets/confectionery		
Yes	51	48.6%
No	54	51.4%

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Source: Research data

Unprocessed and traditional foods had the highest reported consumption, particularly fresh fruits and beans, which most participants reported eating. Beans are traditionally eaten with rice in Brazil. The two foods provide complementary essential amino acids, and greater adherence to this pattern has been associated with a higher intake of nutrients important to older adults' health (Camargo et al., 2025). Reports of fruit intake should be interpreted cautiously because one day of intake cannot establish how regularly a food is eaten. In a study of Brazilians aged 50 or older, the proportion who ate fruit on three to four days per week rose from 16.5% in 2015/2016 to 23.0% in 2019/2021, illustrating the importance of assessing usual frequency (Ygnatios et al., 2026).

Vegetables and greens were reported less often than other unprocessed foods; about four in ten participants did not report eating them. This behaviour depends on individual choices, the food environment, including whether fruits and vegetables are available at home (Ygnatios et al., 2023), and socioeconomic circumstances. Higher educational attainment is associated with greater consumption of fruits, vegetables, and greens, while older adults with less education are more vulnerable to poor dietary patterns. Diet in later life reflects interacting individual, social, and environmental factors in addition to personal motivation and knowledge (Saes et al., 2022).

Among higher-risk foods, hamburgers and processed meats were least frequently reported. This is a favourable finding, although a single day's report cannot establish usual habits. Evidence links processed meats to cancer, cardiovascular disease, and metabolic disorders, although certainty varies by outcome. Reducing consumption of these foods is particularly relevant for older adults and people with chronic conditions such as hypertension (Ren et al., 2026). This result cannot be attributed to health education activities. However, educational interventions for older adults in primary health care have improved behaviours such as eating three meals per day and the ability to seek and assess health information, supporting dietary counselling in this setting (Serbim; Santos; Paskulin, 2022).

Sweetened beverages were among the most prominent findings, reported by about seven in ten older adults. The question covered soft drinks, commercially produced juices, powdered drink mixes, and similar beverages. Excess sugar intake, particularly from beverages, has been linked to weight gain, ectopic fat deposition, increased risk of coronary disease, and depressive symptoms (Huang et al., 2023). This is particularly relevant in a sample in which 40.9% had diabetes mellitus.

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Ultra-processed products also warrant attention. More than 40% of participants reported instant noodles, packaged savoury snacks, or crackers, and nearly half reported filled cookies, sweets, or confectionery. The responses cannot establish quantities or usual frequency. Among older Brazilians, intake of the first group was associated with greater odds of heart failure, and intake of the second with about threefold higher odds, even after adjustment for sociodemographic and clinical factors, including hypertension, diabetes, and obesity (Ribeiro et al., 2024).

Taken together, the markers show that eating beans and fresh fruit does not preclude drinking sweetened beverages or consuming other ultra-processed products. Each question captures a particular food group, so one participant can report both favourable and unfavourable markers. Interventions should support the consumption of traditional foods and reduce consumption of products high in sugars, sodium, and additives. These reports alone cannot establish whether an individual's diet is adequate.

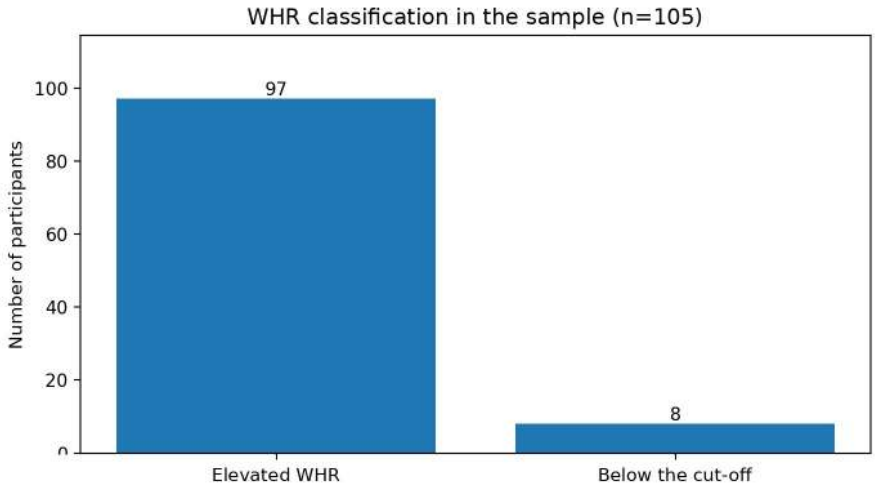
Table 5 presents waist-to-hip ratio (WHR) classification by sex, with values of 0.85 or higher in women and 0.90 or higher in men used as cut-offs for increased risk.

Table 5 – WHR classification by sex

Classification	**Women n (%)**	**Men n (%)**
Elevated WHR	75 (91.5%)	22 (95.7%)
Below the cut-off	7 (8.5%)	1 (4.3%

Source: Research data

Figure 1 – Distribution of participants by WHR classification



Source: Research data

In this sample, elevated WHR was very common among both women and men; only about one in twelve participants was below the cut-off. The table percentages are calculated

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within each sex. The 75 women with elevated WHR represent 91.5% of the 82 women assessed, or 71.4% of all 105 participants. As most of the sample consisted of women (78.1%) and only one man was below the cut-off, comparisons between sexes should be made cautiously. No test of association was performed.

A nationwide study of older Brazilians found that abdominal obesity was more frequent among women (71.5%) than men (34.7%) and was positively associated with multiple chronic conditions. This highlights the importance of assessing abdominal adiposity, particularly in older women and people with multimorbidity (Ygnatios et al., 2025). The present study found no pronounced difference by sex and showed higher prevalences. This may reflect the sample, which consisted exclusively of older adults with SAH and/or DM, and differences in the indicators and cut-offs used.

WHR is an indicator of body fat distribution and reflects central adiposity, which is associated with cardiometabolic risk. This finding is relevant among older adults with SAH and/or DM, in whom abdominal adiposity may complicate blood pressure and glycemic control. Ageing also involves redistribution of fat to the abdominal region and loss of muscle mass. Body mass index does not always capture these changes, which reinforces the usefulness of WHR in this group. Because it is simple, inexpensive, and easy to measure, WHR could be incorporated into routine primary health care to identify older adults at greater risk and guide nutrition education, promotion of physical activity, and multidisciplinary monitoring.

When considered alongside dietary intake markers, the high frequency of elevated WHR suggests that nutrition care should consider both diet and anthropometric characteristics in older adults. The cross-sectional design cannot establish a causal relationship between these factors.

Table 6 presents descriptive statistics for WHR by sex, and Figure 2 illustrates the observed means.

Table 6 – Descriptive statistics for WHR by sex

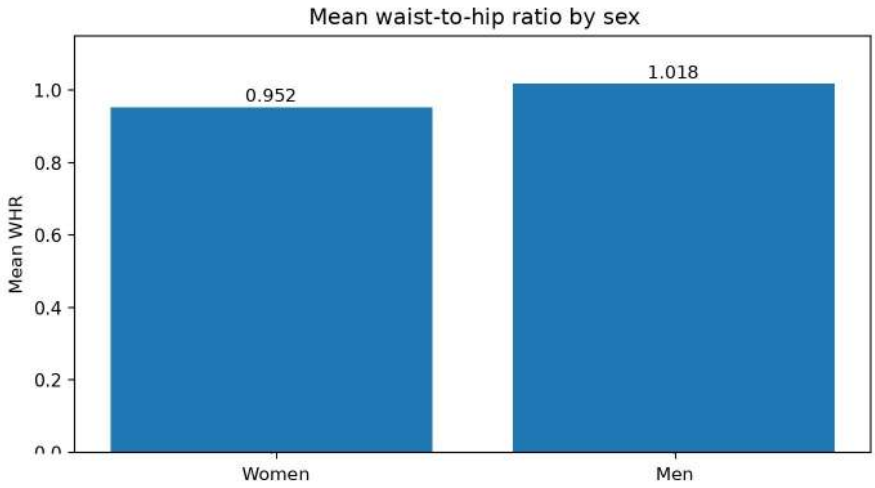
Sex	n	Mean	SD	Minimum–maximum
Women	82	0.952	0.089	0.707-1.184
Men	23	1.018	0.082	0.843-1.160

Source: Research data

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Figure 2 – Mean WHR by sex in older adults followed at a Family Health Unit. Patos, Paraíba, 2026



Source: Research data

Mean WHR exceeded the risk cut-off in both sexes, consistent with the high frequency of elevated WHR in Table 5. Men had a higher mean than women. This difference should be interpreted descriptively because the cut-offs differ by sex, there were few men, and no comparative test was performed. Dispersion was similar between groups. The range of values, particularly among women, shows heterogeneity in central fat distribution.

The literature supports use of anthropometric indicators in assessing chronic conditions in older adults. In one study, participants with hypertension had greater body adiposity regardless of sex. Indicator performance differed by sex: the body adiposity index was more sensitive for identifying hypertension in women, while the conicity index performed better in men (Santos et al., 2023).

A national study found that waist circumference (WC) and waist-to-height ratio (WHtR) were among the best-performing anthropometric indicators for screening for self-reported diabetes mellitus, although anthropometric assessment cannot replace diagnostic tests (Moreira-Souza et al., 2024).

These findings support anthropometry as an accessible tool for identifying people who need further clinical assessment and cardiovascular follow-up. Those studies used measures other than WHR and compared groups with and without the condition. They therefore support anthropometric assessment in general but do not allow direct comparison with the present values. All participants in this study had SAH and/or DM, precluding assessment of WHR's ability to distinguish between people with and without these conditions.

To characterize participants in more detail, the study cross-tabulated dietary intake markers from the Food and Nutrition Surveillance System (SISVAN) against WHR

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classification. This shows the frequencies observed in the anthropometric groups without assuming that observed differences represent statistically demonstrated associations. Only eight participants were below the WHR cut-off, so comparisons have limited precision and should be interpreted cautiously (Table 7).

Table 7 – Dietary intake markers by WHR classification

Marker (yes response)	**Elevated WHR (n=97)**	**Below the cut-off (n=8)**
Beans	78	5
Fresh fruit (excluding juice)	81	8
Vegetables and greens (excluding tubers)	59	1
Hamburgers/processed meats	10	1
Sweetened beverages	68	5
Instant noodles/savoury snacks/crackers	39	5
Filled cookies/sweets/confectionery	47	4

Source: Research data

Among the 97 older adults with elevated WHR, most reported consuming unprocessed or traditional foods, particularly fresh fruit (83.5%). About seven in ten in this group reported sweetened beverages (70.1%) and nearly half reported filled cookies, sweets, or confectionery (48.5%). Favourable markers therefore coexisted with products whose frequent consumption warrants attention in nutrition care for people with chronic diseases.

All eight participants below the WHR cut-off reported fresh fruit, and only one reported vegetables and greens (12.5%). This group also reported ultra-processed products, with 62.5% for both sweetened beverages and instant noodles, savoury snacks, or crackers, and 50.0% for filled cookies, sweets, or confectionery. For some markers, these percentages were similar to or higher than in the elevated-WHR group. They should be interpreted with particular caution because each participant in this group accounts for 12.5 percentage points. The instrument also records only whether a product was consumed on the preceding day, without measuring portions or usual diet.

This descriptive comparison helps explore the relationship proposed in the study title, but it cannot determine the direction, strength, or statistical significance of an association between diet and WHR. Nor can the data show whether reported foods had protective or harmful effects on abdominal adiposity.

Table 8 supplements the analysis by presenting WHR classification by self-reported clinical condition.

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Table 8 – WHR classification by self-reported clinical condition

Clinical condition	Total (n)	Elevated WHR – n	Below the cut-off – n
SAH	62	56	6
DM	7	7	0
SAH/DM	36	34	2

Source: Research data

Elevated WHR predominated in all clinical groups, with frequencies above 90% in each group. The percentages were numerically higher among older adults with DM alone or with SAH and DM than among those with SAH alone. These small differences were based on few participants outside the elevated category (eight in total) and do not allow robust comparisons. In particular, the DM-only group consisted of seven participants, limiting interpretation for this condition.

This result supports assessing body fat distribution during nutrition follow-up in primary health care for people with SAH and/or DM: central adiposity is modifiable and associated with cardiometabolic risk. All interviewees had at least one of the conditions, so the study cannot determine whether the frequency of elevated WHR differs from that among people without SAH or DM. The cross-sectional design also precludes establishing a causal relationship between these conditions and abdominal adiposity.

Finally, Table 9 presents descriptive statistics for WHR by self-reported clinical condition.

Table 9 – Descriptive statistics for WHR by clinical condition

Clinical condition	n	Mean	SD	Minimum–maximum
SAH	62	0.965	0.096	0.707-1.184
DM	7	0.938	0.046	0.879-0.991
SAH/DM	36	0.974	0.091	0.779-1.160

Source: Research data

Mean WHRs were similar across clinical conditions. The mean was numerically highest in the group with both SAH and DM and lowest in the DM-only group, which also showed the lowest dispersion. The DM-only group had seven participants, and the study used no inferential tests or adjustments for potential confounders. These differences are purely descriptive and do not establish that SAH and DM together are associated with higher WHR.

Together, Tables 7, 8, and 9 provide a complementary description of dietary intake markers and WHR distribution in the sample, as specified by the study methodology. They do not establish a statistical association between dietary markers and anthropometric classification,

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a limitation that should inform interpretation of the primary outcome.

Overall, participants reported favourable dietary intake markers, including beans, fresh fruit, vegetables, and greens, alongside markers that warrant attention, especially sweetened beverages and ultra-processed products. WHR exceeded cut-offs in a high proportion of the study population, showing the coexistence of diverse eating behaviours and elevated abdominal adiposity.

Although the descriptive cross-tabulations cannot establish a statistically significant association, these findings, considered alongside the literature, underscore the importance of diet quality in preventing and controlling cardiometabolic risk factors among older adults with SAH and/or DM.

5. Final considerations

Analysis of dietary intake markers and central adiposity in older adults with systemic arterial hypertension and/or diabetes mellitus followed in primary health care found a heterogeneous dietary profile with both favourable and unfavourable markers. Beans and fresh fruit were frequently consumed, while vegetables and greens were reported less often. Consumption of sweetened beverages and ultra-processed products also stood out and warrants attention in nutrition counselling and follow-up.

Waist-to-hip ratio exceeded the cut-offs in 92.4% of participants and was common in both sexes and across the clinical groups. This finding highlights the relevance of anthropometric assessment in primary health care follow-up for older adults with chronic diseases, particularly where factors may contribute to increased cardiometabolic risk.

These findings highlight the importance of nutrition care strategies that support favourable eating habits already present, encourage consumption of unprocessed or minimally processed foods, and reduce consumption of sweetened beverages and ultra-processed products. Waist-to-hip ratio may also support surveillance of central adiposity and inform nutrition education and multidisciplinary monitoring.

Limitations include the cross-sectional design, nonprobability sampling, use of a single health unit, small numbers of participants with WHR below the cut-offs or with DM alone, and absence of inferential statistical analyses. The dietary intake markers instrument covers the day before the interview, so it cannot estimate usual intake or quantify portions. The results should therefore be interpreted descriptively and cannot establish statistical associations or causal relationships among the variables studied.

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The study characterized dietary intake markers and central adiposity in the population investigated, documenting the coexistence of favourable and unfavourable dietary features and a high frequency of central adiposity. These findings support strengthening food and nutrition surveillance and comprehensive primary health care follow-up for older adults with systemic arterial hypertension and/or diabetes mellitus. Future studies with larger samples and analytical designs should examine these variables further and include other indicators of cardiovascular risk.

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