revista de pesquisa ISSN 2175-5361

CUIDADO É FUNDAMENTAL

Escola de Enfermagem Alfredo Pinto – UNIRIO

INTEGRATIVE REVIEW OF LITERATURE *DOI: 10.9789/2175-5361.rpcfo.v17.13487*

PREVALÊNCIA DA SARCOPENIA EM IDOSOS: A VELOCIDADE DE MARCHA COMO FATOR PREDITIVO

Prevalence of sarcopenia in the elderly: gait speed as a predictive factor

Prevalencia de la sarcopenia en personas mayores: la velocidad de marcha como factor predictivo

Marckson da Silva Paula[1]
Neilson Duarte Gomes[2]
Carlos Eduardo de Souza Pinto[3]
Nilber Soares Ramos[4]
Jani Cleria Pereira Bezerra[5]
Estélio Henrique Martin Dantas[6]

RESUMO

OBJETIVO: investigar a relação entre sarcopenia e velocidade de marcha em idosos. **Método:** revisão integrativa realizada nas bases de dados Embase, Pubmed, Scopus e Lilacs. **Resultados:** a busca inicial gerou 5013 resultados, com 18 estudos incluídos, envolvendo 33.833 sujeitos de 60 a 90 anos. A prevalência de sarcopenia variou de 3,7% a 58%. A velocidade média de marcha dos indivíduos sarcopênicos foi abaixo do ponto de corte em 77,8% dos estudos. Em 61,11% dos estudos, o ponto de corte da velocidade de marcha adotado foi 0,8 m/s, e o teste de caminhada de 4 metros (C4m) foi o mais utilizado (38,9%). **Conclusão:** a velocidade de marcha é um bom preditor de sarcopenia e pode servir como triagem para outros testes diagnósticos, embora a variação nos pontos de corte possa complicar a interpretação.

DESCRITORES: Idoso; Sarcopenia; Velocidade de caminhada.

[1,2] Universidade Federal do Estado do Rio de Janeiro, Rio de Janeiro, Rio de Janeiro, Brasil.
[3] Instituto Nacional de Especialidade, Rio de Janeiro, Rio de Janeiro, Brasil.
[4] Universidade Castelo Branco, Rio de Janeiro, Rio de Janeiro, Brasil.
[5] Universidade de Vassouras, Rio de Janeiro, Rio de Janeiro, Brasil.

Received: 2024/08/08. **Accepted:** 2024/10/07

CORRESPONDING AUTHOR: Marckson da Silva Paula.
E-mail: profmarckson@gmail.com
How to cite this article: Paula MS, Gomes ND, Pinto CES, Ramos NS, Bezerra JCP, Dantas EHM. Prevalence of sarcopenia in the elderly: gait speed as a predictive factor. *R Pesq Cuid Fundam (Online)*. [Internet]. 2025 [cited ano mês dia];17:e13487. Available from: https://doi.org/10.9789/2175-5361.rpcfo.v17.13487.

ABSTRACT

OBJECTIVE: to investigate the association between sarcopenia and gait speed in the elderly. **Method**: an integrative review was conducted in the databases Embase, Pubmed, Scopus, and Lilacs. **Results**: the initial search yielded 5013 results, including 18 studies with 33,833 subjects aged 60-90 years. The prevalence of sarcopenia ranged from 3.7% to 58%. The average walking speed of sarcopenic subjects was below the cutoff in 77.8% of the studies. In 61.11% of the studies, the gait speed cut-off was 0.8 m/s, and the 4-meter walk test (4mWT) was the most used test (38.9%). **Conclusion**: gait speed is a good predictor of sarcopenia and can be used as a screening tool for other diagnostic tests, although variations in cutoff points may complicate interpretation.

DESCRIPTORS: Aged; Sarcopenia; Walking speed.

RESUMEN

OBJETIVO: investigar la relación entre la sarcopenia y la velocidad de marcha en personas mayores. **Método**: revisión integrativa realizada en las bases de datos Embase, Pubmed, Scopus y Lilacs. **Resultados**: la búsqueda inicial generó 5013 resultados, de los cuales se seleccionaron 18 estudios que abarcan 33 833 sujetos de entre 60 y 90 años. La prevalencia de sarcopenia varió entre el 3,7 % y el 58 %. La velocidad media de marcha de los individuos sarcopénicos estuvo por debajo del punto de corte en el 77,8 % de los estudios. En el 61,11 % de los estudios, el punto de corte de la velocidad de marcha adoptado fue 0,8 m/s, y la prueba de caminata de 4 metros (C4m) fue la más utilizada (38,9 %). **Conclusión**: la velocidad de marcha es un buen predictor de sarcopenia y puede servir como herramienta de cribado para otros tests diagnósticos, aunque la variación en los puntos de corte puede complicar la interpretación.

DESCRIPTORES: Anciano; Sarcopenia; Velocidad al caminar.

INTRODUCTION

Sarcopenia is characterized by a significant degenerative process in the elderly that is a factor in the increased likelihood of falls, loss of functional mobility, frailty, disability, morbidity and mortality. This process is responsible for the loss of muscle mass and strength. Aging promotes relevant changes in body composition, such as increased body fat and decreased muscle mass. This loss of muscle mass affects 1/3 of people over 50 years of age and another 15% of people between 70 and 80 years of age. The prevalence of sarcopenia increases gradually with age, from 5-13% in people aged 60-70 years to 11-50% in people over 80 years.[1-2]

For an individual to be classified as sarcopenic, several factors must be examined. There are many studies that suggest which variables should be analyzed to define whether an individual is classified as having sarcopenia, and the different methodologies used increase the prevalence rate of this disease. The consensus definition of sarcopenia is the presence of low total skeletal or appendicular muscle mass combined with poor physical performance.[3]

Physical performance can be assessed using a variety of methods and tests. Walking speed (WS) or gait speed (GS) is a telltale sign of central health and function in aging and disease. This variable is a determinant of quality of life and characterizes functional independence. GS undergoes physiological changes with aging, as decreases in lean mass, bone mineral density, and increases in fat mass affect gait patterns, including speed.[2]

In view of these arguments and the importance of the issue for public health, research on the prevalence of sarcopenia in the elderly is relevant, especially with regard to gait speed as a predictor of this condition affecting the aged.

The purpose of this study was to investigate the relationship between sarcopenia and gait speed in the elderly.

METHOD

This study consists of an integrative review conducted in four methodological stages: formulation of the research question, literature search, selection of studies, and data extraction/synthesis. In the first stage, the topic and research question were defined: "What is the relationship between sarcopenia and gait speed in healthy elderly?". In the second phase, conducted between June and August 2024, the databases Embase, Pubmed, Scopus and Lilacs were consulted.

To guide the search strategy, the acronym PCC was used, with the following components P (population: healthy elderly), C (concept: sarcopenia), C (context: gait speed or walking

speed). Inclusion criteria included experimental studies with healthy elderly, published between 2014 and 2024, without language restrictions. Exclusion criteria included studies on elderly with any health impairment, literature reviews, not reporting a relationship between sarcopenia and gait speed, and limited or incomplete articles.

In the third stage, studies were selected using the Rayyan - Intelligent Systematic Review platform.[4] For this purpose, two independent reviewers were involved, who were responsible for screening the articles by title and abstract. Conflicts were resolved by consensus or, if necessary, by a third reviewer.

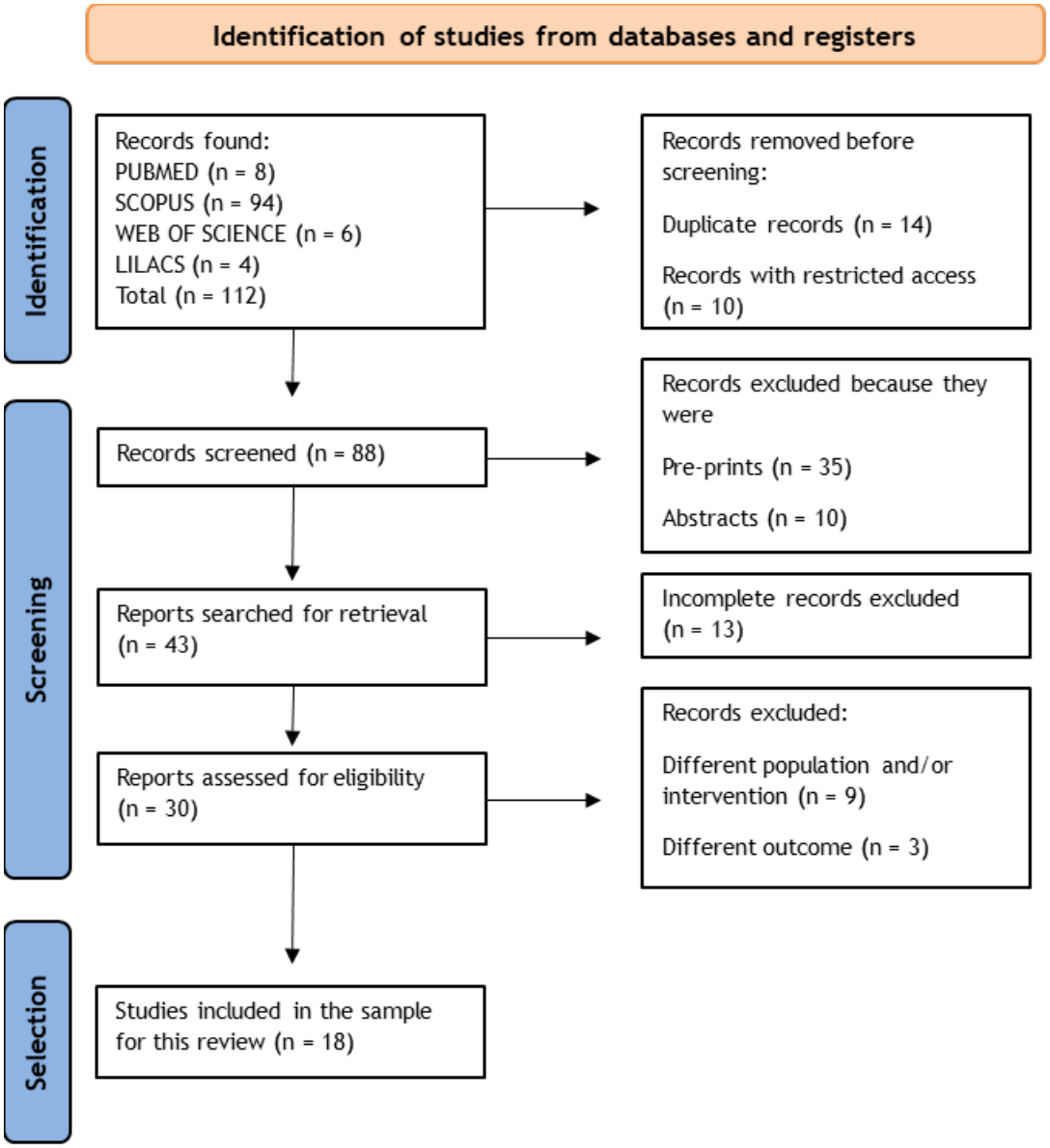
The final step involved data extraction and synthesis, which was performed using Microsoft Excel® spreadsheet software. The extracted data included information such as bibliographic reference, sample characteristics, type of study, instrument used to measure gait speed (GS), GS cutoff point, objectives, and results of the selected studies. This study adhered to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines.[5] Due to the methodological nature of the research, it was not submitted for review by a research ethics committee.

Table 1 – Search strategy applied in the databases. Rio de Janeiro, RJ, Brazil 2024

Databases	Search strategy
EMBASE	'aged'/exp OR aged OR 'elderly'/exp OR elderly AND sarcopenia OR sarcopenias AND 'walking speed' OR speeds) AND walking OR speed) AND walking OR walking) AND speeds OR walking) AND pace OR paced OR paces OR pacing OR pacings) AND walking OR pace) AND walking OR walking) AND paces OR gait) AND speed OR gait) AND speeds OR speed) AND gait OR speeds) AND gait AND [medline]/lim NOT ([embase]/lim AND [medline]/lim) NOT ([embase classic]/lim AND [medline]/lim) AND (2014:py OR 2015:py OR 2016:py OR 2017:py OR 2018:py OR 2019:py OR 2020:py OR 2021:py OR 2022:py OR 2023:py OR 2024:py) AND 'article'/it
PUBMED	("Sarcopenia"[Title/Abstract] OR "Sarcopenias"[Title/Abstract]) AND ("aged"[Title/Abstract] OR "elderly"[Title/Abstract]) AND ("walking speed"[Title/Abstract] OR "speeds walking"[Title/Abstract] OR "speed walking"[Title/Abstract] OR "walking speeds"[Title/Abstract] OR "walking pace"[Title/Abstract] OR (("paced"[All Fields] OR "Paces"[All Fields] OR "pacing"[All Fields] OR "pacings"[All Fields]) AND "Walking"[Title/Abstract]) OR "pace walking"[Title/Abstract] OR "walking paces"[Title/Abstract] OR "gait speed"[Title/Abstract] OR "gait speeds"[Title/Abstract] OR "speed gait"[Title/Abstract] OR "speeds gait"[Title/Abstract])
SCOPUS	TITLE-ABS-KEY (aged) OR elderly AND sarcopenia OR sarcopenias AND {walking speed} OR {speeds walking} OR {speed walking} OR {walking speeds} OR {walking pace} OR paced OR paces OR pacing OR pacings OR walking OR {pace walking} OR {walking paces} OR {gait speed} OR {gait speeds} OR {speed gait} OR {speeds gait}
LILACS	(idosos) OR (ancianos) AND (sarcopenia) AND (velocidade de caminhada) OR (velocidade de marcha) OR (velocidad al caminar)

Source: The Authors.

Figure 1 – Flowchart of the selection of studies analyzed. Rio de Janeiro, RJ, Brazil 2024



Source: Adapted from Page *et al.* (2021).[5]

RESULTS

The sample of this study consisted of 18 experimental studies after the search strategy identified 5013 records in each database. The research subjects were between 60 and 90 years old. The studies had a time frame from 2014 to 2024, with the aim of selecting records from the last ten years and verifying the relationship between two subjects relevant to the academic population (sarcopenia and gait speed). Figure 1 shows the process of identification, screening and inclusion of these studies.

The distribution of studies analyzed by continent was as follows: Asia (33.3%), Europe (27.7%), South America (22.2%), North America (5.6%), and Oceania (5.6%), not reported (5.6%).

The prevalence ranged from 3.7% to 58% in the studies reviewed. The most used instrument to assess gait speed (GS) was the 4-meter walk test (4mWt), which was mentioned in 38.89% of the studies, and 61.11% of the studies used a GS cut-off point of 0.8 m/s. In 77.8% of the studies, the GS of the evaluated patients followed the suggested cut-off point; sarcopenic subjects were those who obtained lower GS values after the tests.

On the other hand, in 16.7% of the studies, there was a discrepancy between the GS values in sarcopenic subjects, and in one case it was not possible to verify the association between GS and sarcopenia, because it was a study in which several methods and different cut-off points for GS, SMM and HGS were used, showing divergences between the cut-off points and the criteria adopted to define sarcopenia.

Table 2 – Study characteristics. Rio de Janeiro, RJ, Brazil 2024

Reference	Sample	Study type
Beaudart *et al.* (2014)[6]	N=400 (age ≥ 65 years; 157M, 243F)	Prospective cohort
Cesari *et al.* (2015)[7]	N=922 (mean age 73.9 years; 396M; 526F)	Prospective cohort
Darroch *et al.* (2022)[8]	N=91 (86.0 ± 8.3 years; 33M, 58F)	Transverse
Silva Alexandre *et al.* (2014)[9]	N=1149 (age ≥ 65 years; 437M, 712F)	Transverse
Salles *et al.* (2023)[10]	N=125 (median age 71 years)	Observational
Dodds *et al.* (2017)[11]	N=719 (age ≥ 85 years; 282M, 437F)	Cohort
Lee e Park (2015)[12]	N=196F (71.2 ± 4.6 years)	Cohort
Gadelha *et al.* (2014)[13]	N=137F (67.76 ± 5.67 years)	N/A
Hashemi *et al.* (2016)[14]	N=300 (66.8 ± 7.72 years)	Transverse
Kemmler, Von Stengel e Kohl (2018)[15]	N=939M (age ≥ 70 years)	Cohort
Khongsri *et al.* (2016)[16]	N=243 (69.7 ± 6.9 years; 62M, 181F)	Transverse
Kitamura *et al.* (2021)[17]	N=1851 (72.0 ± 5.9 years; 917M, 934F)	Cohort
Lee *et al.* (2021)[18]	N=538 (ages 21-90 years 227M, 311F)	N/I
Morat, Gilmore e Rice (2016)[19]	N=24 (79.1 ± 5.8 years, 9M, 15F)	Clinical trial
Perez-Sousa *et al.* (2019)[20]	N= 19705 (average age 70 years; 8741M, 10964F)	Transverse
Sánchez-Rodriguez *et al.* (2015)[21]	N=100 (84.1 ± 8.5 years; 38M, 62F)	Longitudinal and prospective
Tramontano *et al.* (2017)[22]	N=222 (age ≥ 65 years; 102M, 120F)	Clinical trial
Wu *et al.* (2021)[23]	N=6172 (age ≥ 60 years; 3070M, 3102F)	Longitudinal
Total sample:	N=33,833 subjects*	

Source: The Authors.
M: male; F: female; N/I: not informed.
*It was not possible to determine the number of patients evaluated according to gender, since one study did not provide such information.

Table 3 – Applications of gait speed (GS) assessment instruments. Rio de Janeiro, RJ, Brazil 2024

Instrument	Reference
4mWt	Beaudart *et al.* (2014)[6]; Cesari *et al.* (2015)[7]; Lee e Park (2015)[12]; Hashemi *et al.* (2016)[14]; Morat, Gilmore e Rice (2016)[19]; Sánchez-Rodriguez *et al.* (2015)[21]; Tramontano *et al.* (2017)[22]
6minWt	Khongsri *et al.* (2016)[16]; Lee *et al.* (2021)[18]
5mWt	Kitamura *et al.* (2021)[17]; Wu *et al.* (2021)[23]
2,4mWt	Darroch *et al.* (2022)[8]; Lee *et al.* (2021)[18]
15mWt	Salles *et al.* (2023)[10]
10mWt	Kemmler, Von Stengel e Kohl (2018)[15]
3mWt	Perez-Sousa *et al.* (2019)[20]
Timed Up and GO (TUG)	Dodds *et al.* (2017)[11]
TC6	Gadelha *et al.* (2014)[13]
8fWt (SPPB)	Silva Alexandre *et al.* (2014)[9]

Source: The Authors.
4mWt: 4-meter walk test; 6minWt: 6-minute walk test; 8fWt: 8-foot walk test; SPPB: Short Physical Performance Battery test; CP: cut-off point; M: male; F: female

Table 4 – Gait speed (GS) cutoff points. Rio de Janeiro, RJ, Brazil 2024

Reference	GS cutoff point
Beaudart *et al.* (2014)[6]	M (H ≤ 173 cm: <0,65 m/s; H > 173 cm: <0,76 m/s) e F (H ≤ 159 cm: <0,65 m/s; H > 159 cm: <0,76 m/s)
Beaudart *et al.* (2014)[6]; Cesari *et al.* (2015)[7]; Darroch *et al.* (2022)[8]; Silva Alexandre *et al.* (2014)[9]; Salles *et al.* (2023)[10]; Dodds *et al.* (2017)[11]; Lee e Park (2015)[12]; Hashemi *et al.* (2016)[14]; Khongsri *et al.* (2016)[16]; Morat, Gilmore e Rice (2016)[19]; Sánchez-Rodriguez *et al.* (2015)[21]	<0,8m/s
Kitamura *et al.* (2021)[17]; Kemmler, Von Stengel e Kohl (2018)[15]; Lee *et al.* (2021)[18]; Tramontano *et al.* (2017)[22]; Wu *et al.* (2021)[23]	<1,0m/s
Gadelha et al. (2014)[13]; Perez-Sousa et al. (2019)[20]	N/I

Source: The Authors.
H: height; M: male; F: female; N/I: not informed

Table 5 – Objectives and findings of the studies. Rio de Janeiro, RJ, Brazil 2024

Reference	Objective	Findings
Beaudart *et al.* (2014)[6]	To examine the variation in the prevalence of sarcopenia obtained with these cut-offs.	CP 1: 0.8 m/s, CS prevalence of 7.41%. CP 2 (adjusted for sex and height): CS prevalence of 3.7%. There was no significant difference between the diagnostic criteria, except for GS, which was significantly higher in women diagnosed by method D compared to method E (p=0.039) and method F (p=0.035). Each method was based on different cut-off points for SMM, FPM and GS.
Cesari *et al.* (2015)[7]	To test whether different parameters used in definitions of sarcopenia have different abilities to predict future functional decline.	The prevalence of CS was 57.0% (F) and 43.0% (M). GS was significantly associated with CS in men (by standard deviation [SD] = 0.23 m/s increase, hazard ratio [RR] = 0.46, 95% confidence interval [CI] = 0.33-0.63; p<0.001) and women (by SD = 0.24 m/s increase, RR = 0.64, 95% CI = 0.50-0.82; p<0.001).
Darroch *et al.* (2022)[8]	To investigate the prevalence of sarcopenia and associated risk factors in the elderly living in three residential care facilities in Auckland, New Zealand.	The prevalence of CS was 41% (14M and 23F). The GS of sarcopenic: 0.49 ± 1.30 m/s; non-sarcopenic: 0.57 ± 1.45 m/s. No significant differences between groups (p=0.175).
Silva Alexandre *et al.* (2014)[9]	To examine the prevalence of sarcopenia and associated factors in aged living in São Paulo, Brazil.	Prevalence of CS was 15.4% (16.1% in women and 14.4% in men). Significant differences were observed between sarcopenic of both sexes. GS in M/S (n=334): 0.86 ± 0.0m/s; MS (n=103): 0.75 ± 0.03m/s; W/S (n=549): 0.77 ± 0.01m/s; WS (n=163): 0.66 ± 0.02m/s
Salles *et al.* (2023)[10]	To assess the relationship between sarcopenia (in its three domains) and frailty in elderly admitted for non-urgent surgical procedures.	Prevalence of CS was 14%. Frail subjects (n=15); 11 had GS ≤0.8m/s (73.3%) and 4 (26.7%) had GS >0.8m/s. Normal subjects (n=77); 13 had GS ≤0.8m/s (17.6%) and 61 (82.4%) had GS >0.8m/s. Sarcopenia was associated with frailty, more frail individuals had lower GS.
Dodds *et al.* (2017)[11]	To describe the risk factors for sarcopenia and estimate their prevalence and incidence in a British sample of very old people.	Prevalence of CS was 21% (similar results in the sexes M/F). The mean GS of sarcopenic was 0.8 ± 0.3m/s (M) and 0.7 ± 0.3m/s (F) and was below the accepted WC, requiring the use of a second criterion (HGS/SMM)
Lee e Park (2015)[12]	To assess the prevalence of sarcopenia, presarcopenia, and severe sarcopenia in healthy aged women in South Korea.	Prevalence of CS was 7.6% (15F). The mean GS was 1.08 m/s. When CS was determined by GS, GS was <0.8 m/s in 12 women (6.1%). Measurement of GS is recommended by the authors to verify the prevalence of CS because it is fast, inexpensive, and reliable
Gadelha *et al.* (2014)[13]	To examine the association of muscle strength, sarcopenia, and OS with performance in aged women.	Prevalence of CS was 13.9%. GS was not a good predictor of CS, the sarcopenic patients had a mean of 1.48 m/s (above the cut-off point)
Hashemi *et al.* (2016)[14]	To investigate the prevalence and factors associated with sarcopenia and severe sarcopenia in the elderly in Iran.	Prevalence of CS was 20.7% (M), 15.3% (F). It was higher in men >75 years compared to women (36.7% vs. 20%). GS (M) was 0.89 ± 0.21 m/s and (F) 0.80 ± 0.23 m/s. CS was more associated with BMI and SMM than with GS (p<0.05), only the SS group showed a significant difference from GS compared to non-sarcopenic subjects (p<0.05)

Reference	Objective	Findings
Kemmler, Von Stengel e Kohl (2018)[15]	To provide a detailed analysis of the figures in a homogeneous cohort using a core component that integrates disability, physical performance, and autonomy parameters.	Prevalence of CS was 5% (n=47). The GS of the sarcopenic patients followed the adopted cut-off point (1.012 m/s) and was classified as a decisive criterion for the classification of CS
Khongsri *et al.* (2016)[16]	To determine the prevalence of sarcopenia and associated factors among community-dwelling elderly in Thailand.	The prevalence of CS was 30.5% (95% CI: 25.0%-36.5%), with 33.9% (M) and 29.3% (F). GS was <0.8 m/s in 32.1% of subjects (n=78), combined with 20.2% (n=49) who had low HGS and were evaluated by SMM to define the diagnosis of CS
Kitamura *et al.* (2021)[17]	To clarify the prevalence of sarcopenia, its associated factors, and the magnitude of its association with mortality and incident disability, as well as combinations of its components, among community-dwelling Japanese elderly people.	Prevalence of CS was 11.5% (M) and 16.7% (F), with 22% (M/F - aged between 75 and 79 years and 32.4% (M) and 47.7% (F) aged ≥ 80 years. The SC had low EMA and/or FPM and GS. Individuals with CS had lower GS than those without CS (1.1 ± 0.3 m/s, 1.4 ± 0.2 m/s, respectively)
Lee *et al.* (2021)[18]	To provide sex- and age-specific reference values for the Short Physical Performance Battery (SPPB) in community-dwelling Singaporean adults aged 21 years and older.	Prevalence of CS between 21 and 25% (M) and between 17 and 25% (F). GS had a CP-to-CS of ≤1.0 m/s for males (sensitivity 68-70%, specificity 72%) and females (sensitivity 57-64%, specificity 68-71%). This CP also showed better sensitivity and specificity in the SPPB criteria
Morat, Gilmore e Rice (2016)[19]	To investigate whether underlying aspects of the neuromuscular system are related to the core functional tests of the screening algorithm and to identify underlying factors of sarcopenia using this categorization model.	Prevalence was 37.5% for CS and 29.2% for SS. CS classification was performed by GS, SMM and HGS. GS was significantly slower (p<0.01) in subjects with SS compared to the PS group. Subjects with CS (n=9) and SS (n=7) were below the proposed WC (0.82 ± 0.10m/s and 0.71 ± 0.04m/s, respectively)
Perez-Sousa *et al.* (2019)[20]	To investigate the mediating role of gait speed in the relationship between sarcopenia and dependence in ADLs.	Prevalence of CS was 16.1% (verified by CC; 36.3% M and 63.7% F). Regression A (β = -0.02; p=0.001) indicated that CS leads to lower GS
Sánchez-Rodriguez *et al.* (2015)[21]	To evaluate the application of the EWGSOP algorithm in hospitalized elderly patients with impaired functional capacity.	Prevalence of CS was 58% (14M and 44F) using the criteria of HGS, SMM and GS to define the diagnosis. In all cases, GS was <0.8m/s (n=100) and it was necessary to check SMB to confirm the diagnosis
Tramontano *et al.* (2017)[22]	To evaluate the prevalence of sarcopenia and associated factors in a population of elderly living in a rural area of the Peruvian Andes.	Prevalence of CS was 17.6%. The criteria of low SMM and GS were used to define CS. The CS group was significantly slower in GS and 6MINWT (p<0.0001)
Wu *et al.* (2021)[23]	To assess the prevalence of possible sarcopenia, sarcopenia, and severe sarcopenia in Chinese elderly and to identify factors associated with possible sarcopenia based on the updated diagnostic criteria of the Asian Working Group for Sarcopenia 2019 (AWGS 2019).	Prevalence of CS was 18.6% (95% CI 17.7-19.6), 18.4% in men (95% CI 17.0-19.7) and 18.9% in women (95% CI 17.5-20.3) (p=0.578). GS was negatively associated with SP (OR 0.09; 95% CI 0.07-0.12)

Source: The Authors.
PS: pre-sarcopenia; CS: confirmed sarcopenia; SS: severe sarcopenia; GS: gait speed; HGS: handgrip strength; SMM: skeletal muscle mass; CC: calf circumference; M/S: men without sarcopenia; W/S: women without sarcopenia; MS: men with sarcopenia; WS: women with sarcopenia; 6minWt: 6-minute walk test; CP: cut-off point; ADL: activity of daily living; CI: confidence interval; OR: odds ratio or odds ratio of occurrence of an event

DISCUSSION

The study focused on analyzing the prevalence of sarcopenia and evaluating the criteria used to define it, with special attention to gait speed (GS). The aim of this study was to investigate whether GS is a significant predictive factor for the diagnosis of this condition, which is a natural and progressive process associated with aging.

The incidence of sarcopenia, a degenerative process associated with aging, increases with age, as shown by several studies.[8,24,25] The prevalence of sarcopenia may vary due to different cut-off points used in the literature and regional differences.[26] These variations may directly affect the observed prevalence. These may also directly affect the observed prevalence, with evidence showing a variation between 9.25% and 18%.[6]

The cut-off points used to measure strength and muscle mass, especially in women, appear to be more sensitive and may explain the higher prevalence of sarcopenia in women.[6,9,24] However, there are studies suggesting that men are also significantly affected by sarcopenia, with loss of muscle mass occurring twice as fast as in women due to decreased testosterone levels.[27] There is a gap in the literature regarding the standardization of cut-off points for different criteria, including GS.[6]

GS has been used as an important criterion in the diagnosis of sarcopenia, along with other criteria such as handgrip strength (HGS), muscle quality and, in some cases, calf circumference. GS is often cited as an effective predictor of disability in both sexes. It can be considered an indicator of the biological age of the individual, although the authors recommend caution in its use. However, GS is valued for its reliability and practicality, making it an excellent screening factor in the diagnosis of sarcopenia.[7,28]

Several studies have confirmed that GS tends to be lower in sarcopenic or frail individuals than in non-sarcopenic individuals, reinforcing the efficacy of this variable as a predictive factor of sarcopenia.[9,10,11,12,18,19,20,21,22]

GS was also identified as a critical criterion in the diagnosis of sarcopenia and was used as the main indicator of this degenerative process. When GS was below the established cut-off point, the diagnosis of sarcopenia was confirmed. If GS was above the cut-off point, a second criterion, HGS, was used to confirm the diagnosis. This procedure is effective because it is based on a component of physical function and facilitates the screening of individuals through a simpler and more practical assessment. This avoids the need for more expensive muscle mass assessments in cases of low GS.[15]

In some cases, GS was not a good predictor of sarcopenia because the condition was also associated with other factors such as malnutrition and lower body mass index (BMI). However, other studies have reported higher levels of BMI, body fat, and waist circumference in individuals with sarcopenia, which can be explained by the decrease in the hormone estrogen in menopausal women and the decrease in the hormone testosterone in men over the age of 65.[25] In cases where GS was not a good predictor of sarcopenia, it was observed that individuals with and without sarcopenia had similar GS scores, or that sarcopenic individuals had higher GS scores. These findings suggest that caution should be exercised when using GS alone as a diagnostic criterion for sarcopenia.[8,13]

The association between BMI and sarcopenia has been highlighted in several studies, suggesting that this indicator should be included along with muscle mass quality analysis for a more accurate diagnosis of sarcopenia.[8,11,14,24]

In addition to these indicators, other factors have been associated with the prevalence of sarcopenia and can be included to further strengthen the diagnosis of this degenerative process. These factors include calf circumference and waist circumference.[24]

CONCLUSION

It is concluded that gait speed is a good predictor of sarcopenia and may serve as a screening for other diagnostic tests, although the variation in cutoff points may complicate interpretation.

REFERENCES

1. Tu DY, Kao FM, Tsai ST, Tung TH. Sarcopenia among the elderly population: A systematic review and meta-analysis of randomized controlled trials. Health. [Internet]. 2021 [cited 2024 jun 23];9(6). Available from: http://dx.doi.org/10.3390/healthcare9060650

2. Bortone I, Sardone R, Lampignano L, Castellana F, Zupo R, Lozupone M, et al. How gait influences frailty models and health-related outcomes in clinical-based and population-based studies: a systematic review. J. Cachex. Sarcop. Muscle. [Internet]. 2021 [cited 2024 jun 25];12(2). Available from: http://dx.doi.org/10.1002/jcsm.12667

3. Shafiee G, Keshtkar A, Soltani A, Ahadi Z, Larijani B, Heshmat R. Prevalence of sarcopenia in the world: a systematic review and meta- analysis of general population studies. J. Diab. Metabol. Disord. [Internet]. 2017 [cited 2024 jun 26];16(1). Available from: http://dx.doi.org/10.1186/s40200-017-0302-x

4. Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan—a web and mobile app for systematic reviews. Syst. Rev. [Internet]. 2016 [cited 2024 jun 21]. Available from: http://dx.doi.org/10.1186/s13643-016-0384-4

5. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. PLoS. Med. [Internet]. 2021 [cited 2024 jun 23]. Available from: http://dx.doi.org/10.1371/journal.pmed.1003583

6. Beaudart C, Reginster JY, Slomian J, Buckinx F, Locquet M, Bruyère O. Prevalence of sarcopenia: the impact of different diagnostic cut-off limits. J. Muscul. Neur. Interact. [Internet]. 2014 [cited 2024 jun 28];14(4). Available from: https://pubmed.ncbi.nlm.nih.gov/25524968/

7. Cesari M, Rolland Y, Kan GAV, Bandinelli S, Vellas B, Ferrucci L, et al. Sarcopenia-related parameters and incident disability in older persons: Results from the "invecchiare in Chianti" study. J. Gerontol. [Internet]. 2015 [cited 2024 jun 29];70(4). Available from: http://dx.doi.org/10.1093/gerona/glu181

8. Darroch P, O'Brien WJ, Mazahery H, Wham C. Sarcopenia prevalence and risk factors among residents in aged care. Nutrients. [Internet]. 2022 [cited 2024 jul 03];14(9). Available from: http://dx.doi.org/10.3390/nu14091837

9. Silva Alexandre TD, Oliveira Duarte YA, Ferreira Santos JL, Wong R, Lebrão ML. Prevalence and associated factors of sarcopenia among elderly in Brazil: Findings from the SABE study. J. Nutr. Health. Aging. [Internet]. 2014 [cited 2024 jul 07];18(3). Available from: http://dx.doi.org/10.1007/s12603-013-0413-0

10. Salles ICDD, Sernik R, Silva JLPD, Taconeli C, Amaral AA, Brito CMMD, et al. Sarcopenia, frailty, and elective surgery outcomes in the elderly: an observational study with 125 patients (the SAFESOE study). Front. Med. [Internet]. 2023 [cited 2024 jul 09];10. Available from: http://dx.doi.org/10.3389/fmed.2023.1185016

11. Dodds RM, Granic A, Davies K, Kirkwood TBL, Jagger C, Sayer AA. Prevalence and incidence of sarcopenia in the very old: findings from the Newcastle 85+ Study. J. Cachex. Sarcop. Muscle. [Internet]. 2017 [cited 2024 jul 09];8(2). Available from: http://dx.doi.org/10.1002/jcsm.12157

12. Lee ES, Park HM. Prevalence of sarcopenia in healthy Korean elderly women. J. Bone. Metabol. [Internet]. 2015 [cited 2024 jul 11];22(4). Available from: http://dx.doi.org/10.11005/jbm.2015.22.4.191

13. Gadelha AB, Dutra MT, Oliveira RJD, Safons MP, Lima RM. Associação entre força, sarcopenia e obesidade sarcopénica com o desempenho funcional de idosas. Motricidade. [Internet]. 2014 [Cited 2024 jul 13];10(3). Available from: http://dx.doi.org/10.6063/motricidade.10(3).2775

14. Hashemi R, Shafiee G, Motlagh AD, Pasalar P, Esmailzadeh A, Siassi F, et al. Sarcopenia and its associated factors in Iranian older individuals: Results of SARIR study. Arch. Gerontol. Geriatr. [Internet]. 2016 [cited 2024 jul 18];66. Available from: http://dx.doi.org/10.1016/j.archger.2016.04.016

15. Kemmler W, Von Stengel S, Kohl M. Developing sarcopenia criteria and cutoffs for an older Caucasian cohort – a strictly biometrical approach. Clin. Interv. Aging. [Internet]. 2018 [cited 2024 jul 19];13. Available from: http://dx.doi.org/10.2147/cia.s167899

16. Khongsri N, Tongsuntud S, Limampai P, Kuptniratsaikul V. The prevalence of sarcopenia and related factors in a community-dwelling elders Thai population. Osteop. Sarcop. [Internet]. 2016 [cited 2024 jul 23];2(2). Available from: http://dx.doi.org/10.1016/j.afos.2016.05.001

17. Kitamura A, Seino S, Abe T, Nofuji Y, Yokoyama Y, Amano H, et al. Sarcopenia: prevalence, associated factors, and the risk of mortality and disability in Japanese older adults. J. Cachex. Sarcop. Muscle. [Internet]. 2021 [cited 2024 jul 23];12(1). Available from: http://dx.doi.org/10.1002/jcsm.12651

18. Lee SY, Choo PL, Pang BWJ, Lau LK, Jabbar KA, Seah WT, et al. SPPB reference values and performance in assessing sarcopenia in community-dwelling Singaporeans – Yishun study. BMC. Geriatr. [Internet]. 2021 [cited 2024 jul 24];21(1). Available from: http://dx.doi.org/10.1186/s12877-021-02147-4

19. Morat T, Gilmore KJ, Rice CL. Neuromuscular function in different stages of sarcopenia. Exp. Gerontol. [Internet]. 2016 [cited 2024 jul 25];81. Available from: http://dx.doi.org/10.1016/j.exger.2016.04.014

20. Perez-Sousa MA, Venegas-Sanabria LC, Chavarro-Carvajal DA, Cano-Gutierrez CA, Izquierdo M, Correa-Bautista JE, et al. Gait speed as a mediator of the effect of sarcopenia on dependency in activities of daily living. J. Cachex. Sarcop. Muscle. [Internet]. 2019 [cited 2024 jul 26];10(5). Available from: http://dx.doi.org/10.1002/jcsm.12444

21. Sánchez-Rodríguez D, Marco E, Miralles R, Guillén-Solà A, Vázquez-Ibar O, Escalada F, et al. Does gait speed contribute to sarcopenia case-finding in a postacute rehabilitation setting? Arch. Gerontol. Geriatr. [Internet]. 2015 [cited 2024 jul 27];61(2). Available from: http://dx.doi.org/10.1016/j.archger.2015.05.008

22. Tramontano A, Veronese N, Sergi G, Manzato E, Rodriguez-Hurtado D, Maggi S, et al. Prevalence of sarcopenia and associated factors in the healthy older adults of the Peruvian Andes. Arch. Gerontol. Geriatr. [Internet]. 2017 [cited 2024 jul 27];68. Available from: http://dx.doi.org/10.1016/j.archger.2016.09.002

23. Wu X, Li X, Xu M, Zhang Z, He L, Li Y. Sarcopenia prevalence and associated factors among older Chinese population: Findings from the China Health and Retirement Longitudinal Study. PLoS. One. [Internet]. 2021 [cited 2024 jul 28];16(3). Available from: http://dx.doi.org/10.1371/journal.pone.0247617

24. Whaikid P, Piaseu N. The prevalence and factors associated with sarcopenia in Thai older adults: A systematic review and meta-analysis. Int. J. Nurs. Sci. [Internet]. 2024 [cited 2024 jul 29];11(1). Available from: http://dx.doi.org/10.1016/j.ijnss.2023.11.002

25. Carcelén-Fraile MDC, Aibar-Almazán A, Afanador-Restrepo DF, Rivas-Campo Y, Rodríguez-López C, Carcelén-Fraile MDM, et al. Does an association among sarcopenia and metabolic risk factors exist in people older than 65 years? A systematic review and meta-analysis of observational studies. Life. [Internet]. 2023 [cited 2024 jul 29];13(3). Available from: https://doi.org/10.3390/life13030648

26. Qian S, Zhang S, Lu M, Chen S, Liu L, Liu S, et al. The accuracy of screening tools for sarcopenia in older Chinese adults: a systematic review and meta-analysis. Front. Public. Health. [Internet]. 2024 [cited 2024 jul 30];12. Available from: http://dx.doi.org/10.3389/fpubh.2024.1310383

27. Liu J, Zhu Y, Tan JK, Ismail AH, Ibrahim R, Hassan NH. Factors associated with sarcopenia among elderly individuals residing in community and nursing home settings: A systematic review with a meta-analysis. Nutrients. [Internet]. 2023 [cited 2024 jul 31];15(20). Available from: http://dx.doi.org/10.3390/nu15204335

28. Pamoukdjian F, Paillaud E, Zelek L, Laurent M, Lévy V, Landre T, et al. Measurement of gait speed in older adults to identify complications associated with frailty: A systematic review. J. Geriatr. Oncol. [Internet]. 2015 [cited 2024 aug 03];6(6). Available from: http://dx.doi.org/10.1016/j.jgo.2015.08.006