

REVISTA CIENTÍFICA ACERTTE
ISSN 2763-8928

SARCOPENIA, AGING AND QUALITY OF LIFE: CHALLENGES FOR THE PREVENTION AND MANAGEMENT OF CARE FOR OLDER ADULTS

SARCOPENIA, ENVELHECIMENTO E QUALIDADE DE VIDA: DESAFIOS PARA A PREVENÇÃO E A GESTÃO DO CUIDADO À PESSOA IDOSA

SARCOPENIA, ENVEJECIMIENTO Y CALIDAD DE VIDA: DESAFÍOS PARA LA PREVENCIÓN Y LA GESTIÓN DEL CUIDADO DE LAS PERSONAS MAYORES

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e64349
https://doi.org/10.63026/acertte.v6i4.349

PUBLICADO: 11/2026

ABSTRACT
Population aging increases the need for healthcare models capable of preserving autonomy, functional capacity, and social participation. In this context, sarcopenia, characterized by a progressive decline in muscle strength associated with a reduction in muscle quantity or quality and, in severe cases, impaired physical performance, represents a relevant issue for clinical practice, public health, and healthcare service management. This article discusses the relationships between sarcopenia, healthy aging, frailty, social determinants of health, and quality of life, emphasizing their implications for prevention, early diagnosis, planning, and the sustainability of the Brazilian Unified Health System (SUS). This is a narrative, theoretical, and documentary review, prioritizing publications from 2020 to 2026 and incorporating recent Brazilian and international studies. Evidence indicates an association between sarcopenia and poorer quality of life, functional decline, dependency, and increased vulnerability, although its effects are modulated by socioeconomic conditions, support networks, multimorbidity, nutrition, and opportunities for physical activity. The article argues that the SUS response should shift its focus from isolated diagnosis to the preservation of functional capacity through opportunistic screening in primary healthcare, multidimensional assessment, combined interventions, healthcare network integration, continuing education, and the use of functional indicators in planning. It concludes that preventing and managing sarcopenia is simultaneously a strategy for promoting healthy aging, improving the quality of care, and rationalizing resource utilization, without reducing the right to health to a merely economic rationale.

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ISSN 2763-8928

Keywords: Sarcopenia. Healthy aging. Functional capacity. Frailty. Health management. Brazilian Unified Health System.

RESUMO
O envelhecimento populacional amplia a necessidade de modelos assistenciais capazes de preservar autonomia, capacidade funcional e participação social. Nesse contexto, a sarcopenia, caracterizada pela redução progressiva da força muscular associada à diminuição da quantidade ou qualidade muscular e, nos casos graves, ao comprometimento do desempenho físico, constitui problema relevante para a clínica, a saúde coletiva e a gestão dos serviços. Este artigo discute as relações entre sarcopenia, envelhecimento saudável, fragilidade, determinantes sociais da saúde e qualidade de vida, com ênfase nas implicações para prevenção, diagnóstico precoce, planejamento e sustentabilidade do Sistema Único de Saúde (SUS). Trata-se de revisão narrativa, teórica e documental, com priorização de publicações de 2020 a 2026 e incorporação de estudos brasileiros e internacionais recentes. As evidências indicam associação da sarcopenia com pior qualidade de vida, declínio funcional, dependência e maior vulnerabilidade, embora seus efeitos sejam modulados por condições socioeconômicas, redes de apoio, multimorbidade, nutrição e oportunidades de atividade física. Argumenta-se que a resposta do SUS deve deslocar o foco do diagnóstico isolado para a preservação da capacidade funcional, com rastreamento oportunístico na atenção primária, avaliação multidimensional, intervenções combinadas, integração da rede, educação permanente e uso de indicadores funcionais no planejamento. Conclui-se que prevenir e manejar a sarcopenia é, simultaneamente, estratégia de promoção do envelhecimento saudável, qualificação do cuidado e racionalização do uso de recursos, sem reduzir o direito à saúde a uma lógica meramente econômica.

Palavras-chave: *Sarcopenia. Envelhecimento saudável. Capacidade funcional. Fragilidade. Gestão em saúde. Sistema Único de Saúde.*

RESUMEN
El envejecimiento poblacional exige modelos asistenciales que preserven la autonomía, la capacidad funcional y la participación social. En este contexto, la sarcopenia, caracterizada por la pérdida progresiva de fuerza y masa muscular, representa un importante desafío para la salud pública y la gestión sanitaria. Este artículo analiza su relación con el envejecimiento saludable, la fragilidad, los determinantes sociales de la salud y la calidad de vida, destacando sus implicaciones para la prevención y la atención a las personas mayores en el Sistema Único de Salud de Brasil (SUS). Se trata de una revisión narrativa, teórica y documental, basada prioritariamente en publicaciones de 2020 a 2026. Los estudios analizados evidencian asociaciones entre sarcopenia, deterioro funcional, dependencia y menor calidad de vida, con influencia de factores socioeconómicos, nutricionales, clínicos y sociales. Se destaca la necesidad de fortalecer la prevención, el cribado en atención primaria, la evaluación multidimensional y las intervenciones integradas, incluyendo actividad física y atención nutricional. Asimismo, se resalta la importancia de la educación permanente y de indicadores funcionales para la planificación sanitaria. Se concluye que la prevención y el abordaje de la sarcopenia son fundamentales para promover el envejecimiento saludable, mejorar la calidad asistencial y fortalecer la sostenibilidad del SUS, garantizando la salud como un derecho.

Palabras clave*: Sarcopenia. Envejecimiento saludable. Capacidad funcional. Fragilidad. Gestión en salud. Sistema Único de Salud.*

1 INTRODUCTION

Population aging is one of the most significant demographic transformations of the 21st century, with direct effects on healthcare systems, social protection, families, and urban organization. In Brazil, the rapid pace of this transition makes it particularly important to develop responses that go beyond increasing the availability of medical appointments and procedures, focusing instead on maintaining the

autonomy, independence, and social participation of older adults (BRASIL, [s.d.]; WORLD HEALTH ORGANIZATION, 2021).

From the contemporary perspective of healthy aging, health in old age is not synonymous with the absence of disease. The World Health Organization shifts the focus toward functional ability, that is, the ability that enables individuals to be and do what they value, resulting from the interaction between intrinsic capacity, the environment, and individual characteristics. This approach is particularly relevant in societies marked by inequalities, as aging trajectories are shaped throughout the life course and reflect unequal access to income, education, food, housing, physical activity, social relationships, and healthcare services.

Among the conditions capable of compromising functional ability, sarcopenia stands out. The revised European consensus (EWGSOP2) places primary emphasis on low muscle strength in identifying probable sarcopenia; reduced muscle quantity or quality confirms the diagnosis, while poor physical performance indicates greater severity (CRUZ-JENTOFT et al., 2010; 2019). This formulation moves beyond the initial understanding centered solely on the loss of muscle mass and brings the concept closer to outcomes that matter in everyday life.

The relevance of sarcopenia extends beyond medical diagnosis. Reduced muscle strength and physical performance may compromise mobility, activities of daily living, social participation, and perceived quality of life. The meta-analysis by Beaudart et al. (2023) demonstrated poorer health-related quality of life among individuals with sarcopenia, reinforcing that its effects extend across physical, functional, and psychosocial dimensions.

In Brazil, Xavier et al. (2026) systematized the definition, diagnosis, and clinical implications of sarcopenia. This article builds on that contribution but seeks to advance in a distinct and complementary direction: discussing sarcopenia as a public health and healthcare management issue by integrating functional capacity, frailty, social determinants, prevention, service planning, and the sustainability of the Brazilian Unified Health System (SUS). Therefore, the objective is to analyze how the preservation of muscle function can be incorporated into a broader agenda of healthy aging and integrated care.

2 METHODOLOGICAL APPROACH

This is a theoretical study with a qualitative approach, developed through a narrative review of scientific and documentary literature. This research design was chosen because the purpose is to integrate clinical, functional, social, and organizational perspectives, without claiming to provide an exhaustive review or an original statistical synthesis.

The literature search prioritized publications from 2020 to 2026, supplemented by classical studies essential to the conceptual development of sarcopenia. Publications indexed in PubMed/MEDLINE and SciELO were consulted, as well as documents from the World Health Organization and the Brazilian Ministry of Health directly related to the subject. The literature search covered topics such as sarcopenia, healthy aging, functional capacity, frailty, social determinants of health, quality of life, prevention, and healthcare management for older adults. Selection was based on

thematic relevance and the contribution of publications to the study objectives, with emphasis on recent Brazilian and international evidence. In the final update, priority was given to studies published between 2024 and 2026 addressing functional capacity, social determinants, frailty, prevalence and associated factors in Brazil, limitations in activities of daily living, interventions, and economic implications.

The analysis was organized into five thematic areas: (a) healthy aging, functional capacity, and social determinants; (b) sarcopenia, frailty, and vulnerability; (c) implications for autonomy and quality of life; (d) prevention, early diagnosis, and interdisciplinary interventions; and (e) implications for management, planning, healthcare costs, and the sustainability of the Brazilian Unified Health System (SUS). The interpretation sought to distinguish established evidence from management-related inferences, avoiding the attribution of exclusive causality to sarcopenia in outcomes recognized as multifactorial.

3 HEALTHY AGING, FUNCTIONAL CAPACITY, FRAILTY, AND SOCIAL DETERMINANTS

Aging is a heterogeneous process. Individuals of the same chronological age may present very different levels of physiological reserve, mobility, cognition, autonomy, and social participation. For this reason, age alone provides limited information about healthcare needs. The concept of functional capacity allows for a better understanding of this heterogeneity by considering the interaction between physical and mental abilities, the environment, available social resources, and existing opportunities.

Intrinsic capacity, a concept associated with the WHO framework for healthy aging, encompasses the physical and mental capacities that support functionality. The systematic review by Huang et al. (2024) demonstrated that this capacity is socially influenced: higher educational attainment, greater wealth, physical activity, and social participation were associated with better levels of intrinsic capacity. This finding is relevant because it prevents functional decline from being interpreted solely as a biological phenomenon and reinforces the need for intersectoral policies.

Brazilian evidence points in the same direction. Santa Helena et al. (2024), in a population-based study conducted in southern Brazil, identified an association between poorer socioeconomic conditions and low functional capacity. In another area, Marcelino et al. (2024), using data from the ELSI-Brazil study, demonstrated that social network characteristics are associated with frailty. These findings help explain that functional vulnerability is not randomly distributed: it is concentrated in contexts where social disadvantages, reduced access to protective resources, and weaker support networks accumulate.

It is important to note that frailty and sarcopenia are distinct concepts, although they frequently coexist. Frailty describes a state of increased vulnerability to stressors, associated with reduced physiological reserves, whereas sarcopenia focuses on muscular and functional changes. Muscle weakness, slow gait, and low levels of physical activity may occur in both conditions, which explains their overlap. From a healthcare management perspective, this overlap is important: the identification of low muscle strength may serve as an alert for a broader assessment of vulnerabilities, without treating the terms as synonymous.



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The etiology of sarcopenia is multifactorial. Biological aging, physical inactivity, inadequate nutritional intake, inflammation, chronic diseases, hormonal changes, hospitalizations, and periods of immobility interact with social and environmental factors. Therefore, effective prevention does not depend solely on recommending exercise and protein intake; it also depends on ensuring the actual conditions necessary to follow these recommendations, such as urban safety, income, access to adequate food, community facilities, transportation, family support, and longitudinal follow-up.

This perspective broadens the responsibility of healthcare services. Rather than classifying functional loss as an inevitable consequence of aging, it becomes possible to recognize modifiable trajectories and groups requiring more intensive follow-up. In this context, equity means providing responses proportional to individual needs, considering that people exposed to accumulated disadvantages may require additional strategies to preserve their functional capacity.

4 IMPACTS OF SARCOPENIA ON FUNCTIONALITY, AUTONOMY, AND QUALITY OF LIFE

Functionality is a central outcome for older adults because it reflects their actual ability to perform meaningful activities. Getting up from a chair, walking to a service facility, preparing meals, shopping, using transportation, managing medications, and maintaining social relationships depend on different combinations of strength, balance, mobility, cognition, and environmental support. Sarcopenia can compromise a significant part of this chain.

Reduced muscle strength tends to become apparent initially in tasks that require power, weight transfer, and stability. As the loss progresses, instrumental activities may become slower, less safe, or increasingly dependent on assistance. This process is not necessarily linear: environmental adaptations, rehabilitation, assistive technologies, and social support can preserve autonomy even in the presence of physical limitations. Therefore, the outcome relevant to care is not merely the measurement of muscle mass, but rather the impact of the condition on everyday life.

Recent longitudinal evidence reinforces this concern. Zhao et al. (2026), in a systematic review and meta-analysis involving 39 studies and 76,151 participants, observed an association between sarcopenia and an increased risk of functional decline and mortality among community-dwelling older adults. The authors found associations with both physical decline and cognitive-psychological dimensions, although the heterogeneity of the studies calls for caution in interpreting the findings.

In Brazil, Danielewicz et al. (2026), using data from ELSI-Brazil, identified an association between sarcopenia, either alone or combined with obesity, and limitations in basic and, particularly, instrumental activities of daily living, with differences according to sex and adiposity patterns. These findings are relevant to public health because they show that the problem is not restricted to highly debilitated or institutionalized groups; it may also be present among people living in the community and interfere with tasks essential to independent living.

Falls are another outcome of interest, but their relationship with sarcopenia must be interpreted within a multifactorial context. Changes in strength and balance may reduce the ability to respond to disturbances; however, falls also depend on vision, medications, cognition, the home environment,



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footwear, neurological and cardiovascular diseases, among other factors. Sarcopenia should be considered one component of a risk assessment, rather than the sole explanation.

Health-related quality of life makes it possible to capture effects that isolated biomedical measures do not reveal. The meta-analysis by Beaudart et al. (2023), which included 43 observational studies, found relevant differences between individuals with and without sarcopenia. The SarQoL, a specific instrument developed by Beaudart et al. (2015), provides greater sensitivity to dimensions related to muscle function and may complement generic instruments in research and clinical follow-up.

From a psychosocial perspective, loss of strength may trigger fear of falling, voluntary restriction of activities, reduced social interaction, and greater dependence. A potential feedback cycle may thus develop: reduced activity decreases muscle stimulation and opportunities for participation, which may worsen physical deconditioning and social isolation. Preventing this cycle requires early recognition of functional changes before they develop into established disability.

For public health, the central implication is that sarcopenia should be treated as a marker of functional risk, rather than merely as a diagnostic label. Its value increases when integrated with multidimensional assessment, fall history, nutrition, multimorbidity, medication use, cognition, mood, support networks, and housing conditions. This integration brings the assessment closer to the concept of healthy aging and makes it possible to develop care plans guided by goals that are meaningful to each individual.

5 PREVENTION, EARLY DIAGNOSIS, AND INTERDISCIPLINARY INTERVENTIONS

The prevention of sarcopenia should be understood at different levels. In primordial and primary prevention, the objective is to reduce prolonged exposure to factors that contribute to muscle loss and low functional reserve throughout the life course. Secondary prevention seeks to identify early losses in strength, mobility, and performance. Tertiary prevention aims to limit disability, recover the function that can be regained, and prevent further adverse events.

Physical activity is a central component. Resistance exercises, balance training, and functional activities can improve strength and performance, particularly when prescribed progressively and adapted to individual needs. The review by Dharmansyah et al. (2026) updates this discussion by bringing together evidence on interventions related to sarcopenia and fall prevention. It highlights the value of combined exercise and nutrition strategies while also emphasizing the need for caution when inferring that reversing sarcopenia alone will reduce falls.

The nutritional dimension must be individualized. Adequate protein and energy intake are relevant, but guidance should take into account renal function, chronic diseases, oral health, dysphagia, appetite, access to food, cultural preferences, and the ability to prepare meals. For individuals experiencing food insecurity or social isolation, a technically appropriate recommendation may be impractical unless it is coordinated with social protection services and community support.

Within the Brazilian Unified Health System (SUS), early diagnosis does not necessarily mean incorporating high-cost tests as the first step. Primary healthcare can begin by identifying warning signs,

such as difficulty standing up, reduced walking speed, falls, weight loss, decreased strength, or a significant reduction in activity. It can also use simple screening tools and functional measurements when appropriate training and standardization are available. Suspected cases may then be referred for diagnostic and multidisciplinary assessment according to risk and regional availability.

A Brazilian study by Pinheiro et al. (2025), involving older adults referred by Primary Healthcare to a specialized service in the Federal District, found a high prevalence of sarcopenia and severe sarcopenia, as well as associated clinical and socioeconomic factors. Although the reference sample is not representative of the general Brazilian older adult population, the results highlight the importance of referral pathways between primary healthcare and specialized services, as well as the need to consider local particularities.

Interdisciplinary collaboration is essential because the determinants of this condition span different professional fields. Physicians and nurses can identify clinical risks and review comorbidities and medications; physical therapists and physical education professionals can address strength, balance, and performance; nutritionists can improve dietary intake and nutritional status; occupational therapists can adapt tasks and environments; speech-language therapists can intervene in swallowing disorders; and social workers can identify barriers to access and available support networks. The benefit does not result merely from adding different professionals, but from establishing shared goals and a coordinated care plan.

Interventions should be monitored through meaningful outcomes. In addition to muscle strength and mass, it is advisable to monitor walking speed, the ability to stand up, the occurrence of falls, performance in activities of daily living, social participation, and quality of life. This approach makes it possible to assess whether the intervention is producing functional benefits and prevents care from becoming excessively focused on isolated markers.

6 CHALLENGES FOR HEALTHCARE SERVICE MANAGEMENT, PLANNING, AND THE SUSTAINABILITY OF THE SUS

The main contribution of a management approach is to shift sarcopenia from the exclusive domain of diagnosis to the broader field of healthcare organization. Within the Brazilian Unified Health System (SUS), this means asking not only how to confirm the condition, but also where to identify risk, who should provide follow-up, which interventions can be offered at each level of the healthcare network, how to ensure continuity of care, and which outcomes should be monitored.

Primary Health Care (PHC) occupies a strategic position because it follows individuals over time and makes it possible to identify changes before they develop into acute events. Functional assessment can be incorporated into consultations and follow-up activities for older adults, particularly among groups experiencing falls, weight loss, recent hospitalization, multimorbidity, polypharmacy, or reduced mobility. The management advantage of simple measures is that they allow initial risk stratification and direct specialized resources toward those who need them most.



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This strategy requires clear care pathways. A screening policy without the capacity to provide an appropriate response may simply increase referrals and waiting lists. Therefore, implementation must be coordinated with the provision of rehabilitation, nutritional care, physical activity programs, home care, and specialized assessment, according to local circumstances. Protocols must establish referral and counter-referral criteria, the responsibilities of each level of care, and communication mechanisms among healthcare teams.

The World Health Organization's Integrated Care for Older People (ICOPE) model provides a useful framework by guiding services toward the maintenance of intrinsic capacity and functional ability through early identification of decline, person-centered assessment, and coordination between health and social care services (WORLD HEALTH ORGANIZATION, 2017). For the SUS, this perspective is consistent with the principles of comprehensive care and longitudinal follow-up and may help overcome an organization that is excessively fragmented by diseases.

Planning also requires information. Traditional indicators, such as the number of consultations, examinations, and hospital admissions, are insufficient to assess whether the system is preserving autonomy. Indicators of strength, mobility, falls, activities of daily living, and the need for assistance can improve territorial assessment and enable the monitoring of outcomes. At the local level, combining clinical and social data can identify territories with greater vulnerability and guide community-based initiatives, exercise groups, home visits, and intersectoral coordination.

The economic dimension must be addressed rigorously. Sarcopenia, frailty, and disability may increase the use of healthcare services, hospitalizations, rehabilitation, and the need for care. Economic evaluation in health constitutes an important tool for supporting management decisions, allowing the analysis of costs, benefits, and the use of available resources in the organization of health services and the implementation of health interventions (DE LIBERAL, 2020). International studies show a significant economic burden: Darvishi et al. (2024) estimated substantial direct and indirect costs associated with disability attributable to sarcopenia among older adults in Iran. These results cannot be directly extrapolated to the SUS, due to epidemiological, monetary, and healthcare system organizational differences, but they demonstrate that functional decline has measurable economic consequences and deserves national investigation.

Prevention may therefore contribute to sustainability by avoiding or delaying high-cost events and dependency. However, this statement should be formulated as a planning hypothesis rather than an automatic promise of savings. Not every preventive intervention reduces expenditures in the short term; some initially increase costs by expanding diagnosis and the provision of care. Benefits may emerge in the form of improved quality of life, more years lived independently, fewer avoidable hospitalizations, or reduced needs for intensive and long-term care.

This distinction is important for public management guided by social value. The sustainability of the SUS does not simply mean spending less, but rather using limited resources in ways that produce greater health, equity, and functional capacity. This perspective must consider that the rational use of public resources needs to be compatible with the guarantee of the right to health and the existential



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minimum (REIS; DE LIBERAL, 2024). Decisions regarding sarcopenia prevention programs should consider effectiveness, cost, feasibility, reach, adherence, distributional impact, and opportunities for integration with existing initiatives involving physical activity, nutrition, fall prevention, and chronic disease management.

Continuing education is an operational component of this change. Oliveira and Mello Costa De Liberal (2026) advocate for Continuing Health Education as a management tool integrated with planning, personnel management, and the transformation of work processes. Applied to sarcopenia, this perspective means using concrete problems, such as the under-identification of functional decline, delayed referrals, and fragmentation between primary healthcare and rehabilitation services, as triggers for learning within the healthcare service itself. The aim is not merely to offer courses on diagnostic criteria, but to review routines, establish agreed-upon care pathways, and evaluate outcomes.

Xavier et al. (2026), in turn, provide a theoretical review focused on the definition, diagnosis, and clinical implications of sarcopenia. The contribution proposed here is to connect this knowledge to the organization of the SUS: functional capacity as an objective, social determinants as risk modifiers, prevention as a component of planning, continuing education as a management tool, and economic assessment as support for, rather than a substitute for, public decision-making.

In practical terms, a management agenda can be structured around five coordinated actions: recognizing the loss of strength and mobility as relevant signs in healthcare for older adults; stratifying risk through simple instruments and multidimensional assessment; ensuring access to feasible combined interventions; organizing referral, counter-referral, and continuity of care; and monitoring functional outcomes and equity. Implementation should be gradual, adapted to local territories, and accompanied by evaluation, avoiding protocols disconnected from the actual capacity of healthcare services.

Finally, sustainability depends on addressing inequalities. If physical activity, adequate nutrition, access to rehabilitation, and support networks are unequally distributed across society, universal programs may produce unequal benefits. Management must identify barriers to access, adapt interventions to different territories, and prioritize individuals experiencing greater vulnerability. In this sense, preventing sarcopenia is also an agenda for equity in aging.

7 FINAL CONSIDERATIONS

Sarcopenia represents a relevant health concern among older adults, given its effects on muscle strength, mobility, autonomy, social participation, and quality of life. However, understanding its implications for public health requires a broader approach that considers not only muscle-related changes but also healthy ageing, functional capacity, and the social determinants of health.

The evidence discussed throughout this study indicates that functional decline, frailty, and sarcopenia should not be understood as inevitable consequences of ageing, but rather as multifactorial phenomena influenced by clinical, behavioral, social, and environmental conditions. This perspective



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broadens the possibilities for prevention and reinforces the need for integrated strategies that go beyond isolated interventions and address the different dimensions involved in the health of older adults.

In this context, the main challenge for the Brazilian Unified Health System (SUS) is to translate scientific knowledge into effective care practices. Although Primary Health Care plays a strategic role in the early identification of signs of functional decline, its effectiveness depends on coordination with a healthcare network capable of providing comprehensive assessment, rehabilitation, nutritional guidance, physical activity programs, and longitudinal follow-up. To this end, continuing professional education, the adoption of feasible protocols, improved information systems for planning, and the monitoring of functional indicators are essential components.

From an economic perspective, sarcopenia prevention also has implications for healthcare planning and the sustainability of health services. Preserving functional capacity may help reduce avoidable healthcare utilization and delay dependency; however, its primary purpose should remain the promotion of more years lived with autonomy and dignity. Thus, SUS sustainability requires balancing the guarantee of the right to health, equity, and the responsible use of available resources.

It should be acknowledged, however, that, given its narrative review design, this study does not intend to exhaust the scientific literature on sarcopenia or provide original quantitative estimates. Its contribution lies in bringing together clinical, functional, and social evidence with issues related to healthcare management and planning, thereby providing support for incorporating the preservation of functional capacity into strategies for older adult care within the SUS.

In light of these considerations, the development of a public agenda to address sarcopenia does not necessarily depend on the creation of a specific program, but rather on incorporating muscle function and functional capacity into existing policies and strategies for older adult care. To advance in this direction, future studies in Brazil should investigate implementation strategies, cost-effectiveness, budget impact, inequalities in access, and functional outcomes across different SUS contexts.

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