

Functional Mobility in Older Adults: Determinants, Assessment and Strategies for Preserving Functional Capacity

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Abstract

Aging is associated with progressive changes in the neuromuscular, sensory and cardiorespiratory systems that may compromise the performance of motor tasks required for daily living. In this context, functional mobility constitutes an important component of functional capacity in older adults, involving the ability to perform movements and body transitions safely, efficiently and independently. This article aims to discuss the main determinants of functional mobility in aging, the instruments used for its assessment, and intervention strategies designed to preserve and improve it. A narrative literature review was conducted, including classical studies and contemporary publications addressing mobility, physical performance, sarcopenia, balance, gait, fall risk and physical exercise in older adults. The literature indicates that functional mobility is a multidimensional phenomenon determined by the interaction among muscle strength, power, balance, gait speed, coordination,

cardiorespiratory capacity, cognitive functions, chronic diseases and environmental characteristics. Instruments such as the Timed Up and Go, the Short Physical Performance Battery and gait speed tests allow the identification of limitations in physical performance and may contribute to functional risk stratification. Available evidence indicates that multicomponent programs, particularly those combining resistance training, balance and functional tasks, are important strategies for preserving or improving mobility and reducing the risk of falls. It is concluded that functional mobility assessment should be incorporated into health care for older adults, not only as an indicator of motor performance, but also as an element associated with independence, social participation, quality of life and healthy aging.

Keywords: aging; functional mobility; physical performance; functional capacity; older adults; physical exercise.

1. INTRODUCTION

Population aging is one of the major contemporary demographic shifts. However, increased longevity should not be analyzed solely in terms of years lived, but also regarding the conditions in which those years are experienced. In this context, the World Health Organization (WHO) identifies functional capacity as a central element of healthy aging, defining it as a person's ability to do what they value in life, resulting from the interaction between their intrinsic capacity and the environment in which they live (World Health Organization, 2020).

Among the components of functional capacity, mobility is particularly significant. Moving around inside and outside the home, rising from a chair, walking, changing direction, climbing and descending stairs, and performing transfers are seemingly simple actions, yet they rely on the integration of multiple physiological systems. A reduced ability to perform these tasks can be one of the first observable signs of functional decline.

Therefore, functional mobility should not be reduced merely to the ability to walk. Although gait is a key element, mobility also encompasses postural transitions, balance control, changes in speed and direction, the ability to respond to perturbations, and the execution of motor tasks in diverse environments. Consequently, assessing it requires tools capable of capturing various dimensions of physical performance.

Aging is associated with a reduction in muscle mass and function, alterations in postural control, slower motor processing speed, and changes in the visual, vestibular, and proprioceptive systems. Sarcopenia—particularly when accompanied by reduced strength and physical performance—can contribute to mobility limitations. The revised European consensus on sarcopenia highlights the importance of muscle strength and physical performance in identifying the condition, shifting the focus away from a concept based solely on the quantity of muscle mass (Cruz-Jentoft et al., 2019).

The loss of mobility carries implications that extend beyond the motor domain. Difficulty walking or performing transfers can lead to reduced physical activity, increased dependence in activities of daily living, limited social participation, and a higher risk of falls. This creates a potential feedback loop in which reduced mobility leads to decreased physical activity, which, in turn, can accelerate the decline in strength, balance, and functional capacity.

On the other hand, functional mobility is a modifiable capacity. Regular physical activity—particularly programs combining strength training, balance exercises, and functional tasks—plays a significant role in maintaining physical capacity during aging. WHO recommendations indicate that older adults should engage in regular physical activity and incorporate multicomponent activities that emphasize functional balance and strength training, especially to improve functional capacity and prevent falls (World Health Organization, 2020). However, translating these recommendations into practice remains a challenge, as exercise prescription for older adults is still frequently limited to generalized, “one-size-fits-all” guidelines that do not fully account for individual heterogeneity in functional capacity, frailty, and comorbidities (Silva et al, 2026).

Against this backdrop, the aim of this article is to discuss, based on the scientific literature, the concept of functional mobility in aging, its key determinants, the tools used for its assessment, and intervention strategies capable of preserving or improving this capacity.

2. METHODOLOGY

This study is characterized as a narrative literature review, qualitative in nature and descriptive in approach. The narrative review format was selected because it allows for the integration of diverse conceptual perspectives and evidence regarding functional mobility in aging, encompassing observational studies, intervention trials, systematic reviews, scientific consensus statements, and institutional documents.

Scientific works related to the following thematic areas were considered: functional mobility, physical performance, functional capacity, gait speed, balance, fall risk, sarcopenia, strength training, multicomponent exercise, and healthy aging.

The literature search was guided by combinations of the terms: functional mobility, older adults, aging, physical performance, gait speed, Timed Up and Go, Short Physical Performance Battery, sarcopenia, falls, and exercise. Priority was given to articles published in indexed scientific journals, documents from international organizations, and works deemed relevant to the conceptual development of the field.

Study selection was based on relevance to the study's objective, methodological significance, and contribution to understanding the relationship between aging, physical performance, and functional mobility. The review incorporated both classic studies—crucial for the foundation of assessment tools—and more recent systematic reviews and documents.

As this is a narrative review based exclusively on scientific literature and public documents, there was no direct participation of human subjects or collection of primary data.

3. DISCUSSION

3.1 Functional mobility and functional capacity in aging

Functional capacity can be understood as the ability to perform activities necessary or meaningful for daily life in an independent and safe manner. Functional mobility constitutes one of its fundamental dimensions, as it allows the individual to move through the environment and perform the transitions necessary to carry out various activities.

However, this relationship does not imply that functional mobility and functional capacity are equivalent concepts. Functional capacity is broader in scope, involving the interaction between physical capacity, cognitive capacity, autonomy, participation, and the environment. Within this framework, mobility represents a dimension particularly related to motor performance.

The WHO emphasizes that healthy aging does not presuppose the absence of disease. An older person may have chronic conditions yet still maintain high levels of functional capacity when their health conditions are adequately controlled and when environments exist that support the maintenance of autonomy (World Health Organization, 2020).

This perspective is particularly important for understanding mobility. A motor limitation does not necessarily stem from chronological age alone. Two individuals of the same age may exhibit vastly different levels of strength, balance, gait speed, endurance, and autonomy. Functional decline results from the interaction between biological aging, disease, behavior, socioeconomic conditions, the environment, and opportunities for participation.

Functional mobility can, therefore, be understood as an emergent property arising from the integration of different capacities. Walking briskly, for example, depends not only on lower-limb strength but also on coordination, balance, range of motion, cardiorespiratory capacity, and sensory processing.

3.2 Physiological determinants of functional mobility

Among the physiological factors associated with functional mobility, muscle strength plays a central role. The progressive, age-related decline in strength can compromise fundamental actions such as rising from a chair, climbing stairs, or initiating and maintaining gait.

Sarcopenia represents a particularly relevant condition in this context. The revised European Working Group on Sarcopenia in Older People consensus (EWGSOP2) emphasizes that low muscle strength is a key feature in identifying sarcopenia, whereas reduced physical performance contributes to characterizing more severe cases (CRUZ-JENTOFT et al., 2019).

However, muscle strength should not be considered in isolation. Muscle power—simply defined as the ability to generate force rapidly—is significantly related to functional tasks requiring quick responses. Rising from a chair, regaining balance after a perturbation, or initiating gait are examples of situations where the speed of force production may be more relevant than maximal strength (Schettino et al, 2013; Pereira et al, 2010).

Balance is another essential determinant. Maintaining posture during gait requires the continuous integration of visual, vestibular, and proprioceptive information. With aging, changes in any of these systems can compromise the ability to maintain postural stability.

Furthermore, mobility depends on the coordination of body segments. Walking, changing direction, or overcoming obstacles involves the temporal and spatial organization of movements. In older individuals—especially those with cognitive, neurological, or sensory deficits—performing motor and cognitive tasks simultaneously can pose an additional challenge. Recent methodological analyses caution, however, that

brief global screening tools may underestimate the contribution of executive function to motor performance in this population (Machado, 2025).

3.3 Gait speed as a marker of physical performance

Gait speed has become one of the most widely used indicators for assessing physical performance in older adults. Its importance stems, in part, from the simplicity of its measurement and its ability to integrate various physiological components.

Gait can be considered a form of "functional synthesis" of the body, as performance depends on the interaction between strength, balance, coordination, joint mobility, and cardiorespiratory capacity. Consequently, a reduction in habitual walking speed may signal systemic changes that would not be easily identified by assessing a single component in isolation.

A classic study by Studenski et al. (2011), involving 34,485 community-dwelling older adults, demonstrated an association between gait speed and survival. A pooled analysis of nine cohorts showed that faster gait speeds were associated with greater survival, reinforcing the prognostic value of this indicator.

However, it is important to avoid interpreting gait speed solely as a biological or deterministic marker. Gait performance is also influenced by the environment, the use of assistive devices, fear of falling, motor experience, and task demands.

Thus, gait speed is best understood as a global indicator of physical performance, capable of helping to identify individuals who require further functional assessment.

3.4 Instruments for assessing functional mobility

Functional mobility assessment can employ various instruments, depending on the clinical or scientific objective.

The Timed Up and Go (TUG) test is one of the most well-known instruments for assessing functional mobility. The individual starts in a seated position, stands up, walks a set distance, turns around, returns, and sits down again. The time required to complete the task provides an objective measure of functional performance.

The importance of the TUG lies precisely in its functional nature: unlike a measure of strength or static balance alone, the test requires the integration of standing up, walking, turning, and sitting down. Recent reviews continue to identify the TUG, gait speed, and the Short Physical Performance Battery (SPPB) as relevant tools for assessing the physical performance of community-dwelling older adults (EXTER et al., 2024). In very old populations, physical performance measures such TUG have even been reported to outperform brief cognitive screening instruments, such as KKSE, in predicting Independence in activities of daily living, although such comparisons should be interpreted cautiously given the methodological limitations of single, low-sensitivity cognitive tools (Machado, 2025).

The Short Physical Performance Battery (SPPB) is another widely used instrument. Developed by Guralnik et al. (1994), the battery combines assessments of balance, gait speed, and the ability to repeatedly rise from a chair. The original study demonstrated an association between performance on these tests and self-reported disability, mortality, and admission to long-term care facilities.

One advantage of the SPPB is precisely its multidimensional approach. Rather than focusing on a single task, the instrument seeks to capture various aspects of lower-limb performance.

Despite the utility of these instruments, no single test can fully represent functional mobility. An individual might perform well on a standardized test while simultaneously experiencing significant difficulties in real-world situations—such as walking on uneven surfaces, crossing the street, carrying objects, or performing dual tasks.

Therefore, the most appropriate assessment must consider the individual's functional context, combining objective measurements with information regarding activities of daily living, fall history, use of assistive devices, and environmental characteristics.

3.5 Functional mobility and fall risk

The relationship between mobility and falls is particularly relevant. Falls constitute a major public health issue among older adults and can lead to injuries, hospitalizations, fear of falling, and reduced physical activity.

However, this relationship is bidirectional. Low mobility can increase the risk of falls, while a fall can trigger a decline in mobility. After experiencing a fall, some older adults voluntarily restrict their movement due to the fear of another episode. This restriction can reduce exposure to physical and social activities, contributing to a further loss of functional capacity.

International recommendations for fall prevention emphasize exercise programs that incorporate balance and functional tasks, including movements such as standing up and sitting down, squatting, moving about, changing direction, and various forms of walking (MONTERO-ODASSO et al., 2022).

Guidelines recommend that fall prevention programs be individualized, progressive, and performed with sufficient frequency. For community-dwelling older adults, it is recommended that balance and functional exercises be performed at least three times a week for a minimum of 12 weeks, with progression tailored to individual capabilities (MONTERO-ODASSO et al., 2022).

This recommendation carries an important conceptual implication: training mobility means, in part, training movements similar to those required in daily life.

3.6 Physical exercise and preservation of mobility

Physical activity constitutes one of the main modifiable strategies to preserve functional capacity during aging. The WHO recommends that older adults people perform between 150 and 300 minutes a week of moderate-intensity aerobic activity, or an equivalent amount of vigorous activity, in addition to muscle strengthening exercises on at least two days a week. It also recommends multicomponent activities with an emphasis on functional balance and strength on three or more days of the week (WORLD HEALTH ORGANIZATION, 2020).

For functional mobility, however, it is not enough to consider only the total amount of physical activity. The type of stimulus is fundamental.

Strength training is important to combat the loss of muscle strength and promote the execution of tasks such as getting up, climbing stairs and walking. Given

that explosive force capacity appears to decline earlier than maximal strength, training approaches that specifically target rate of force development may be particularly relevant for preserving functional performance in older adults (Schettino et al, 2014). Balance training helps to improve postural control. Functional training make it possible to integrate different capabilities into tasks similar to those found in everyday life. Dance-based exercise programs illustrate this multicomponent logic well, as they combine balance demands, coordinated movement patterns, and rapid postural adjustments; older women engaged in such programs have demonstrated significantly greater capacity to develop explosive muscular force than sedentary peers (PEREIRA et al, 2010).

This combination characterizes multicomponent programs. A Systematic review with network meta-analysis on exercise for sarcopenia demonstrated that resistance exercises, alone or combined with aerobic and balance exercises, confer benefits on different indicators of physical function and quality of life (Shen et al., 2023). Similar results are observed when specifically analyzing strategies aimed at mobility. The literature shows that programs that combine strength, balance and functional tasks can improve indicators such as TUG performance and gait speed, although the magnitude of the effects depends on the characteristics of the population and the exercise program. In this sense, the prescription must be individualized. A physically independent older adults may require stimuli that are substantially different from those indicated for a person with low strength, a history of falls or significant gait limitations (Silva et al, 2026).

3.7 The specificity of functional training

Preserving mobility requires considering the principle of specificity. If the goal is to improve the ability to stand, walk, change direction, or overcome obstacles, it is reasonable for part of the training to include these actions or closely related movements. International fall prevention guidelines recommend exercises that reproduce functional demands, including standing up and sitting down, squatting, taking steps in different directions, reaching for objects in an upright position and walking at different speeds and conditions (MONTERO-ODASSO et al., 2022).

This does not mean abandoning traditional strength exercises or aerobic training. On the contrary, these components can provide the physiological capabilities necessary for the individual to perform functional tasks with greater safety and efficiency.

Functional training can, therefore, be understood less as a specific type of exercise and more as a strategy for integrating physical capabilities into tasks relevant to everyday life.

3.8 Mobility, autonomy, and social participation

The relevance of functional mobility extends beyond the execution of motor tasks. The ability to move about is a prerequisite for participation in various social settings.

An older adult who can walk to a shop, use public transport, visit family, participate in community activities, or frequent leisure spaces has different opportunities for participation than someone whose mobility is severely limited.

Thus, reduced mobility can trigger indirect social and psychological consequences. Limited mobility can increase dependence on family members and caregivers, restrict social activities, and foster isolation.

This perspective aligns with the WHO concept of healthy aging, in which maintaining functional capacity is considered central to enabling people to continue doing what they value (WORLD HEALTH ORGANIZATION, 2020).

Consequently, preserving mobility does not simply mean improving the result of a physical test. The ultimate goal is to enable the older adult to maintain autonomy and participation for as long as possible.

3.9 The role of the environment

Although much of the literature on functional mobility emphasizes individual characteristics, the environment also plays a decisive role.

Inadequate sidewalks, a lack of ramps, insufficient lighting, household obstacles, staircases without handrails, and inaccessible public transport can turn a moderate physical limitation into a significant restriction on mobility.

The contemporary perspective on healthy aging recognizes precisely this interaction between individual capacity and the environment. The WHO emphasizes that supportive environments can enable individuals to maintain their functional capacity even in the face of age-related changes (WORLD HEALTH ORGANIZATION, 2020).

This means that interventions aimed at mobility should not focus exclusively on the individual. In certain situations, modifying the environment can be just as important as improving physical capacity.

Promoting functional mobility must, therefore, combine individual interventions—such as physical exercise and rehabilitation—with environmental and social strategies that reduce barriers to movement.

4 CONCLUSION

Functional mobility is a fundamental component of an older adult's functional capacity and is closely linked to independence, autonomy, social participation, quality of life, and the risk of falls. Its decline should not be viewed as an inevitable or uniform consequence of aging, as it results from the interplay of physiological changes, diseases, behavior, physical activity levels, cognitive factors, environmental characteristics, and social conditions.

Literature shows that muscle strength, power, balance, gait speed, and the ability to perform motor tasks in a coordinated manner are key elements of mobility. In this context, tools such as the Timed Up and Go test, the Short Physical Performance Battery, and gait speed tests can provide valuable information on physical performance and aid in the early identification of functional limitations.

However, assessment must go beyond the mere use of isolated tests. Functional mobility is a multidimensional capacity, and its analysis must take into account the actual demands of daily life, fall history, the use of assistive devices, clinical conditions, and environmental characteristics.

Regarding intervention strategies, evidence supports individualized, progressive programs that integrate strength training, balance exercises, aerobic

activity, and functional tasks. Exercise specificity is particularly important when the goal is to preserve movements essential for autonomy, such as rising from a chair, walking, changing direction, and climbing stairs.

Thus, preserving functional mobility should be understood as a strategy for promoting healthy aging, rather than merely an intervention aimed at correcting existing motor deficits. Early identification of declines in physical performance and the adoption of regular physical activity programs can help prolong functional independence and expand opportunities for social participation among older adults.

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