

Commentary

Conceptualizing the Functional Training Exercise for Older People

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Abstract

Regular exercise is the most viable and inexpensive way to achieve a wide range of positive changes in the body and has been widely recommended for the older people because of the numerous neuromuscular, metabolic and behavioural benefits provided by this intervention. Such benefits enhance physical fitness and cognitive ability, favouring improved quality of life and increasing longevity independently. Currently, the prescription of neuromuscular conditioning programs aimed at the development and maintenance of daily activities in the elderly has been based on functionality. However, the functional training, considered by many to be the main method to meet the daily needs of the individual, needs further discussion in the scientific literature and therefore, this text presents an insight into the premises, characteristics and definitions of this exercise program, aiming at provide practitioners with applicable information to facilitate the design of useful and assertive interventions. Thus, we anticipate a possible paradigmatic change in the current models associated with the guidelines for physical exercise, with the inclusion of recommendations directed to the functionality of the individual.

Keywords: Aging; Activities of daily living; Quality of life

Commentary

It is estimated that the number of people over the age of 60 will almost triple worldwide by 2050, making it a challenge to keep them independent until the end of their lives. This independence of the senile is directly related to functional fitness, that is, the ability to perform daily activities efficiently, safely and without excessive fatigue [1].

In turn, functional fitness is determined by multiple health-related factors, including mainly neuromuscular and cardiorespiratory performance. These reduced physiological conditions with senescence affect cause cardiovascular and musculoskeletal problems, while physical exercise can attenuate this multisystem decline and reduce the incidence of disease [2,3].

In this perspective, the devoted search of health professionals for exercise programs that best fit the elderly population has made functional training (FT) the most studied and applied method in recent years, being present from 2007 among the twenty trends and in support of this view, the National Strength and Conditioning Association, in its current position on prescribing exercise for the elderly, includes FT as one of the modalities to consider [4].

La Scala Teixeira et al. [5] define FT as set of exercises designed to improve performance in activities that are often performed by humans.

Thus, it aims at the integrated development of physical capabilities, promoting the improvement of ability and functional capacity to perform daily actions with autonomy and safety.

Based on the practical application of the biological principles of physical training, in particular the principle of specificity [6].

According to Da Silva-Grigoletto et al. [7], FT has a basic premise of improving the human psychobiological system. This method is based on the application of multisegmental and multiplanar exercises, combined with acceleration, reduction and stabilization movements, with the main objective of improving movement quality, improving core strength and neuromuscular efficiency, in addition to adapting to the specific needs of each individual.

Given the above, it is clear that the goal of FT for the elderly is to maintain independence and prevent fragility. However, there is a vast scientific production that objectively addresses the effects of traditional training on "functional" proposals, for the development and improvement of different neuromuscular characteristics and in the performance of daily activities [8]. Thus, it is noteworthy that any training protocol can be considered functional as long as it is safe, effective and specific to meet the needs of the individual's daily life.

In this way, understanding the concept of FT and the psychobiological characteristics of the human aging process, the main question arises: What are the characteristics of a physical training protocol aimed at improving the activities of daily living of the elderly? The answer is what I will discuss from now on.

Most traditional strength training protocols performed on machines, based predominantly on analytical exercises with isolated neuromuscular work; have as their basic premise aesthetic improvement through stress in specific muscle groups [9].

For training to be considered functional, it should focus on improving movement patterns that, according to Cook et al. [10], are intentional combinations of stable and moving segments working in coordinated harmony to produce efficient and effective motion sequences.

In the case of the elderly, strength exercises should include patterns of squatting, pulling, pushing and carrying objects, always performed at maximum concentric speed and with similar neuromuscular and metabolic specificity to meet daily activities and prevent the onset of physical disabilities (Table 1) [11].

Traditional	Functional
Fixed pattern of movement	Varied pattern of movement
Often uniplanar	Focused on multi-plane stabilization
Focused on mono-articular exercises	Focused on multiarticular exercises
Focused on concentric and eccentric actions	Focused on muscle synergy
Emphasis on neuromuscular components	Emphasis on all components of physical fitness

Table 1: Traditional training compared to functional training.

Another important aspect for providing multisystem adaptations is the interaction of various physical capacities. According to Chodzko-Zajko et al. [12], neuromuscular training programs for the elderly should include: aerobic exercise to maintain and / or improve various aspects of cardiovascular function; working with overloads to compensate for muscle mass and strength losses; balance exercises to maintain body control and reduce the risk of falls; and flexibility exercises to maintain adequate levels of joint mobility in the structures most commonly used in daily life. Recently, Fragala et al. [4] recommended that comprehensive exercise programs that include dynamic strength and muscle power training, cardiorespiratory exercise combined with balance activities are effective in improving physical capacity and preventing functional decline in the elderly.

For example, a simple walk depends on the use of strength, mobility, dynamic balance, motor coordination and postural stability. If maintained for a long period, muscle and cardiorespiratory endurance add to the aforementioned components [13]. From this perspective, Thompson [3] defines FT as the use of resistance training not only for strength development but also for balance, motor coordination, power and endurance to increase individuals' ability to perform simple daily activities (Figure 1).



Figure 1: Illustration of the possible components of functional fitness necessary for good performance in activities of daily living. Source: Liu et al. [14].

Among the mentioned components, the major and essential stimulus of muscle power is also an important feature for FT sessions, justified by the speed in habitual movements being varied and generally fast. For example, sitting and getting up from a chair tends to occur within fractions of seconds [15]. Moreover, it is the variable that most decays with advancing age and has the best relationship with functional performance [16].

Moreover, aiming at the integrated development of neuromuscular and metabolic aspects, the use of different training practices is a necessity. These include plyometric exercises that improve muscle power, basic surveys that improve the execution of movement patterns, coordinative training that improves cognition, unstable balanceenhancing aids, and high-intensity interval workouts for improve aerobic and anaerobic performance for daily activities [17].

Nonetheless, some precautions should be taken with the use of unstable bases, because, despite promoting positive changes in neuromuscular coordination, the gains in maximum dynamic strength and muscle power are lower than under stable conditions and present low safety for the elderly with alterations in the vestibular and somatosensory systems [18].

Other important features of the TF are the dynamism and instability of the exercises themselves, which stimulate the postural control systems and activate the spinal stabilizer muscles more intensely, making the conditions of agility, dynamic balance and proprioception more developed [19]. According to Granacher et al. [20], trunk muscle strength is associated with static and dynamic balance, functional performance and risk of falls in the elderly. Incidentally, the core functions are known to maintain proper body alignment against the action of gravity, stabilize the spine and pelvis during body movements, and prevent injury, being the stimulation of this muscle group is essential for senile [21].

Finally, FT for the elderly also incorporates dual-task activities into their sessions, usually a motor action combined with a cognitive task, such as squatting while thinking about the activities performed the day before. In addition, functional exercises must require high complexity and motor variability, which will make it difficult to remember and reproduce the exercises, thus representing a constant cognitive challenge and therefore an important stimulus for improving mental health [22].

For a better view of systematized training programs and exercise examples that meet the aforementioned characteristics, see: Resende-Neto et al. [23] and Resende-Neto et al. [24].

Conclusion

The reported information suggests that a physical training program designed to stimulate the various systems that promote health benefits should focus on improving the physical fitness components in exercises specific for the activities of the daily life, providing adequate amount of exercise regarding the possibilities of response to the stimulus and guarantee of optimal adjustments, respecting safety, efficacy and functionality criteria.

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