



## **Strength Training and Inclusion: Personal Trainer Strategies for the Health of Seniors and People with Special Needs**

## **Strength Training and Inclusion: Personal Trainer Strategies for the Health of Older Adults and People with Special Needs**

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### **Summary**

Population aging and the growing recognition of the rights of people with disabilities have highlighted the need for inclusive practices in Physical Education.

In this context, strength training emerges as a fundamental tool for promoting health, functional autonomy and quality of life for the elderly and individuals with special needs.

This article aims to analyze, from a scientific and applied perspective, the contribution of personal trainers in developing resistance programs adapted to different conditions, such as osteoporosis, sarcopenia, and motor and intellectual disabilities. To this end, the article discusses the physiological effects of strength training on aging, the necessary adaptations in exercise protocols for special populations, the role of the professional as an agent of inclusion and public health, and the observed physical, cognitive, and social benefits. The analysis combines data from international and national research, pointing the way toward evidence-based and diversity-sensitive professional practice.

**Keywords:** Resistance training; Inclusion; Personal trainer; Elderly; Special needs.

### **Abstract**

Population aging and the growing recognition of the rights of people with disabilities have highlighted the need for inclusive practices in Physical Education. In this context, strength training emerges as a fundamental tool for promoting health, functional autonomy, and quality of life in older adults and individuals with special needs. This article aims to analyze, from a scientific and applied perspective, the contribution of personal trainers in designing resistance programs adapted to different conditions, such as osteoporosis, sarcopenia, motor and intellectual disabilities. It discusses the physiological effects of strength training on aging, the necessary adaptations in



exercise protocols for special populations, the role of professionals as agents of inclusion and public health, and the physical, cognitive, and social benefits observed. The analysis articulates data from international and national research, pointing to pathways for a professional practice grounded in evidence and sensitive to diversity.

**Keywords:** Resistance training; Inclusion; Personal trainer; Older adults; Special needs.

## 1. Physiological effects of resistance training on aging

Human aging is accompanied by inevitable physiological changes that compromise functional capacity, autonomy, and quality of life. Among the most significant changes are sarcopenia—progressive loss of muscle mass—and osteopenia and osteoporosis—reduction in bone mineral density, along with decreased strength, flexibility, and motor coordination (CRUZ-JENTOFT et al., 2019). In this context, resistance training is one of the most effective interventions to mitigate such declines, being widely recommended by international organizations such as the *World Health Organization* (WHO, 2015) and the *American College of Sports Medicine* (ACSM, 2020). Literature shows that regular strength training improves functional capacity, reduces the risk of falls, and contributes to maintaining independence in older adults.

From a physiological perspective, resistance training stimulates muscle fiber hypertrophy, especially type II fibers, which undergo greater reductions with aging (FLEG et al., 2016). By increasing muscle mass and strength, older adults can perform everyday tasks more efficiently, such as climbing stairs, carrying objects, and maintaining a stable posture while walking.

Furthermore, there is a significant improvement in neuromuscular capacity, as training promotes adaptations in motor recruitment, motor unit synchronization, and neural firing rate (KRAEMER; RATAMESS, 2004). These adaptations are essential to offset the natural decline of the neuromuscular system that accompanies aging.

Another relevant aspect concerns bone health. Studies show that resistance training is associated with increased or maintained bone mineral density in older adults, preventing osteoporosis and reducing the risk of fractures (WATTS et al., 2010). The mechanical overload applied to bones during training stimulates bone remodeling through the action of osteoblasts, strengthening the structure and promoting greater resistance. This effect is especially important for postmenopausal women, who experience greater bone mass loss due to decreasing estrogen levels. Thus, strength training acts as a protective factor against one of the most debilitating conditions associated with aging.

The effects of resistance training also extend to metabolism and cardiovascular health.

Research shows that periodized strength programs reduce insulin resistance, improve the lipid profile and contribute to blood pressure control (VINCENT et al., 2002).

These metabolic adaptations have a direct impact on the prevention of non-communicable chronic diseases.



transmissible diseases, such as type 2 diabetes and hypertension, which are highly prevalent in the elderly population. Furthermore, strength exercises promote greater energy expenditure, favoring body weight control, which is an additional risk factor for several comorbidities.

From a psychological and cognitive perspective, resistance training also offers consistent benefits. Studies such as that by Cassilhas et al. (2007) show that strength training programs are associated with improved cognitive function, memory, and attention in older adults, possibly due to increased cerebral perfusion and the release of neurotrophic factors. This reinforces the idea that physical exercise is a multidimensional intervention capable of promoting physical and mental health. Improved mood, reduced depressive symptoms, and stronger self-esteem are also frequently reported, demonstrating that the impacts of training extend beyond the physiological dimension.

Therefore, resistance training in aging should be understood as an essential public health strategy. Literature shows that its regular practice not only combats the deleterious effects of aging but also enhances functional capacity, prolonging independence and improving quality of life. In this context, the personal trainer plays a central role in prescribing and monitoring programs, ensuring that programs are safe, effective, and tailored to the individual needs of each older adult. Thus, resistance training is consolidating itself as an indispensable tool in facing the challenges of an increasingly aging society.

## **2. Adaptation of strength protocols for different clinical and functional conditions**

Prescribing resistance training for special populations, such as elderly individuals with osteoporosis or people with motor or intellectual disabilities, requires personal trainers to possess in-depth scientific knowledge and practical sensitivity. The challenge is not limited to the application of exercises, but also involves developing adapted strategies that balance safety, effectiveness, and inclusion. According to Fragala et al. (2019), strength training can be performed safely by virtually all population groups, as long as physiological and functional characteristics are respected. This reinforces the need for individualized protocols, planned based on detailed physical assessments and, in many cases, with interdisciplinary support.

In the case of osteoporosis, a common condition among the elderly, the prescription should prioritize controlled-impact exercises and multi-joint movements capable of generating bone overload without excessive risk of fractures. Programs that include squats, deadlifts, and bodyweight exercises, adapted to the individual's capacity, have shown positive results in bone mineral density (WATTS et al., 2010). However, it is essential to respect range limits, avoid sudden overloads, and value gradual progression. Furthermore, the combination of

Resistance exercises with balance and proprioception activities enhance the prevention of falls, one of the greatest risks for this population.

For people with motor disabilities, such as spinal cord injuries, cerebral palsy, or amputations, resistance training needs to be adapted to their residual capacities. In these cases, the use of specific equipment, resistance bands, seated exercises, and support devices are essential. According to studies by Tweedy and Vanlandewijck (2011), strength training in individuals with motor disabilities improves not only muscle function but also cardiovascular and psychological parameters, contributing to greater autonomy. The role of the personal trainer is to identify the client's potential and create safe alternatives to encourage strengthening.

In the context of intellectual disabilities, such as Down syndrome or autism spectrum disorders, strength programs must consider cognitive and behavioral limitations. The literature indicates that individuals with these conditions can achieve significant gains in strength, coordination, and self-esteem when enrolled in adapted resistance programs (CARMELI et al., 2002). The key lies in the simplicity of instructions, the systematic repetition of movements, and the emphasis on motivational strategies. In this sense, the personal trainer acts not only as an instructor but also as a social mediator, promoting inclusion and participation.

Chronic diseases such as hypertension, diabetes, and obesity also require specific adaptations. Intensity must be carefully monitored, prioritizing slow progressions and avoiding blood pressure spikes or cardiovascular overload (ACSM, 2020). The use of subjective effort scales, such as Borg RPE, can help regulate intensity. Furthermore, combining resistance training with aerobic exercise has been shown to be effective in controlling blood glucose and lipid profiles, reinforcing the importance of integrated protocols (RHEA et al., 2003). These strategies are essential to promote safety and effectiveness in the training process.

It's important to emphasize that adapting protocols doesn't mean reducing effectiveness. On the contrary, studies indicate that, when well-structured, adapted programs can produce results comparable to those of populations without restrictions (FRAGALA et al., 2019). The difference lies in the adaptation of training variables—load, volume, frequency, and exercise selection—to the individual's characteristics. The personal trainer must act with a critical and creative vision, transforming limitations into possibilities and ensuring that each client reaches their maximum potential within their conditions.

Thus, adapting strength protocols to different clinical and functional conditions demonstrates the importance of professional practice grounded in science and principles of inclusion. By respecting the specific needs of the elderly, people with disabilities, or those with chronic illnesses, personal trainers expand the scope of resistance training, transforming it into a tool for health, autonomy, and citizenship. This approach confirms that strength is not a privilege for the few, but a right for all.

### 3. The role of the personal trainer as an agent of inclusion and public health

The contemporary personal trainer should not be seen solely as a professional focused on individual physical performance, but as a true agent of health promotion and social inclusion. In a scenario marked by an aging population and the increased visibility of people with disabilities, their role extends beyond gyms and into public health. According to the World Health Organization (WHO, 2015), encouraging physical activity is considered a priority for reducing healthcare costs and increasing population longevity. In this context, the personal trainer, by prescribing adapted programs, directly contributes to the prevention of chronic diseases and the promotion of functional autonomy, with positive impacts on both the individual and society.

A central aspect of the personal trainer's inclusive role is their ability to mediate physical and social barriers that often prevent older adults and people with special needs from exercising. According to Carvalho and Marques (2017), the perception of self-efficacy is fundamental for adherence to training programs, especially in more vulnerable groups. The professional must, therefore, offer technical and motivational support, creating welcoming and safe environments. This means adapting protocols, using accessible language, and recognizing individual achievements, strengthening the confidence of practitioners. This approach contributes not only to physical results but also to the social inclusion of these individuals.

groups.

Another important point is the educational role played by the personal trainer. By imparting knowledge about the benefits of resistance training, explaining the principles of progression, and demystifying prejudices associated with aging or disability, the professional plays a fundamental pedagogical role. As Fleck and Kraemer (2014) point out, clarifying the scientific basis of exercise increases adherence and promotes greater body awareness among practitioners. This educational dimension transcends the physical space of the gym and can generate ripple effects, encouraging families and communities to value regular physical activity.

The role of personal trainers as agents of inclusion also relates to public health policies. Research by Fragala et al. (2019) indicates that resistance training programs aimed at the elderly and people with disabilities, when implemented on a large scale, significantly reduce hospitalization and medication costs. Thus, the work of personal trainers contributes to the sustainability of the healthcare system, reinforcing its social relevance. Furthermore, partnership initiatives between physical education professionals and public or community institutions can expand access to inclusive practices, ensuring that vulnerable populations are not excluded for economic or structural reasons.



Another fundamental role of the personal trainer is that of an agent of citizenship. By including seniors and people with disabilities in training programs, the professional not only promotes health but also reinforces social values of equity and respect for diversity. Inclusion through physical exercise strengthens social bonds, combats isolation, and promotes self-esteem, all essential elements for a good quality of life. In this sense, the personal trainer assumes a role that goes beyond the individual, contributing to the construction of a more just and healthy society.

Therefore, personal trainers should be understood as key players in the interconnection between science, professional practice, and social inclusion. Their role is not limited to prescribing exercises but also involves pedagogical, social, and political responsibilities. By assuming this expanded role, professionals not only enhance their careers but also respond to emerging demands in contemporary society, consolidating their position as strategic agents of public health and inclusion.

#### **4. Physical, cognitive and social benefits observed in older adults and people with disabilities**

The benefits of resistance training for older adults and people with disabilities are not limited to muscle strengthening or improved functional capacity, but also encompass highly relevant cognitive and social dimensions. From a physical perspective, the scientific literature consistently demonstrates significant gains in strength, muscle mass, and bone density, as already pointed out by Fragala et al. (2019) and Schoenfeld (2016). These gains result in greater autonomy for daily activities, fall prevention, and reduced musculoskeletal pain. In individuals with motor disabilities, adapted exercises expand the functionality of residual capacities, allowing greater independence in movement, object manipulation, and basic daily tasks.

In the cognitive field, the effects of resistance training are also evidenced in recent research. Cassilhas et al. (2007) demonstrated that strength training programs in the elderly are associated with improved memory, attention, and cognitive processing speed. These results are attributed to increased cerebral perfusion, the release of neurotrophic factors such as BDNF (*Brain-Derived Neurotrophic Factor*), and the psychosocial stimulation provided by group practice. For people with intellectual disabilities, the systematic repetition of exercises and the experience of objective progress contribute to improved concentration, self-esteem, and discipline, strengthening cognitive and socio-emotional skills.

From a social perspective, resistance training promotes inclusion and combats isolation, factors often associated with aging and disability. Research by Carvalho and Marques (2017) highlights that regular practice in collective settings fosters the development of social bonds, expanding support networks, and reducing depressive symptoms. For people with disabilities, participating in adapted training programs also represents a form of social recognition, as it breaks down barriers of prejudice and reaffirms the right to



citizenship. This social dimension of the practice is as important as the physiological results, as it directly impacts quality of life.

Another benefit observed is improved body self-perception. Seniors who participate in resistance programs report greater satisfaction with their appearance and increased confidence in physical activity, even after years of inactivity. For people with disabilities, the experience of overcoming challenges and achieving concrete goals strengthens self-image and reduces feelings of inadequacy. This psychological aspect is highlighted by Ratamess (2012) as one of the most relevant factors for long-term adherence, as it creates a positive relationship between the individual and physical exercise.

The systematic practice of resistance training also indirectly impacts families and communities. More active older adults require less care, reducing the burden on family members and caregivers. People with disabilities who gain greater autonomy become more involved in social, educational, and professional activities, contributing to inclusion in different spheres of life. This social impact broadens the scope of the benefits of training, transforming it into a tool for not only individual but also collective transformation.

Therefore, the physical, cognitive, and social benefits of resistance training for older adults and people with disabilities are broad and interdependent. The literature confirms that regular practice, when adapted and monitored by qualified personal trainers, produces results that transcend the physiological realm, positively impacting emotional and social dimensions. This finding reinforces the importance of inclusive policies and science-based professional practice to ensure these benefits are accessible to all.

## 5. Integration between resistance training, mobility and quality of life

Resistance training is recognized as an essential tool for gaining strength and hypertrophy, but its impact goes beyond the muscular dimension. When integrated with mobility, balance, and flexibility practices, it significantly enhances functional benefits, especially for the elderly and people with disabilities. According to Fragala et al. (2019), preserving mobility is one of the main determinants of autonomy in older adults, and the combination of strength and range of motion ensures greater ability to perform daily tasks. The literature indicates that programs that combine resistance exercises and mobility yield superior results in balance, coordination, and fall prevention compared to isolated interventions.

Joint mobility tends to decrease with age due to structural changes such as muscle stiffness and osteoarthritis. In this sense, strength training, when combined with dynamic stretching exercises, helps preserve range of motion and slow the progression of joint limitations (ACSM, 2020). This integration is even more relevant in



Special needs, such as people with motor disabilities, who may have compensatory movement patterns and postural rigidity. Prescribing exercises that strengthen specific muscle groups, combined with mobility techniques, promotes better biomechanical alignment and reduces overload, preventing pain and injuries.

From a functional perspective, the association between strength and mobility is crucial for independence. Older adults with greater lower limb strength and good joint range of motion find it easier to rise from chairs, climb stairs, and maintain balance on uneven terrain. Studies by Bean et al. (2010) show that integrated resistance and mobility programs significantly improve performance on functional tests, such as the *Timed Up and Go* (TUG), increasing safety and confidence in performing daily activities. This finding reinforces that integrating different physical capabilities should be a priority in personal trainers' work.

Another benefit of this integrated approach is the reduction of chronic pain, common in the elderly and people with disabilities. Programs that combine muscle strengthening and mobility exercises have shown effectiveness in reducing low back, joint, and musculoskeletal pain (SCHOENFELD, 2016). This is because strengthening stabilizes joint structures, while mobility reduces tension and improves movement patterns.

For the personal trainer, this knowledge is essential, as it allows the development of programs not only focused on performance, but also on quality of life.

The integration of resistance training and mobility also benefits psychosocial aspects. Improved bodily functionality increases confidence and reduces feelings of inadequacy, often associated with aging and disabilities. As Carvalho and Marques (2017) point out, the perception of autonomy is directly related to self-esteem and the motivation to maintain exercise. Thus, the impact is not only physical but also psychological and social, strengthening family and community bonds.

In short, the association between resistance training, mobility, and quality of life should be understood as a central strategy in the personal trainer's work. Rather than prescribing strength or stretching in isolation, the professional should integrate different physical capabilities into a unique program tailored to individual needs. This approach enhances results, prevents limitations, and promotes inclusion, solidifying physical exercise as a tool for comprehensive health.

## 6. The role of public policies and community programs

While the individual role of the personal trainer is essential, promoting health and inclusion through resistance training also depends on public policies and community programs that expand access to these practices. Population aging and the increased demand for inclusion of people with disabilities make it essential that governments and





Institutions should implement collective initiatives to promote physical activity. According to the World Health Organization (WHO, 2015), physical inactivity is one of the main risk factors for global mortality, and community interventions are effective strategies to combat this problem. In this context, policies that encourage resistance exercise in public spaces or free programs have a direct impact on public health.

In Brazil, initiatives such as the *Academia da Saúde program*, established by the Ministry of Health in 2011, represent examples of public policies that seek to expand access to physical activity for vulnerable populations. Although they do not always specifically include resistance training, these programs provide opportunities for physical education professionals and enable the implementation of protocols adapted for the elderly and people with disabilities (MENDES; COSTA, 2016). The challenge is to ensure adequate resources, infrastructure, and trained professionals so that the service meets the specific demands of these populations.

In developed countries, community intervention models also demonstrate the potential of public policies. In the United States, programs linked to the *National Institute on Aging* have shown that the practice of resistance exercises in community groups reduces hospitalizations, improves health indicators and increases longevity (NELSON et al., 2007). These results reinforce that investment in physical activity should not be seen simply as an expense, but as a public health savings strategy, reducing costs related to hospitalizations and medications.

Another important point is the integration of community programs with educational and awareness-raising initiatives. Campaigns to encourage resistance training, when combined with clear information about its benefits, increase adherence and dismantle prejudices. Many older adults still associate strength training with the risk of injury, while people with disabilities may not see themselves as suitable for this practice. The role of public authorities and institutions is precisely to break down these barriers, creating inclusive and accessible environments that reinforce the idea that strength is for everyone.

Personal trainers also play an active role within these policies. Their inclusion in community programs expands the reach of resistance training and contributes to the democratization of the practice. As Fragala et al. (2019) point out, the professional's work in collective settings enables the application of adapted methodologies on a large scale, promoting not only individual but also collective benefits. Furthermore, the presence of qualified professionals in public policies strengthens the social recognition of Physical Education as a strategic area for health.

Therefore, strengthening public policies and community programs is essential to increase the impact of resistance training on older adults and people with disabilities. The literature shows that collective interventions are effective, but their success depends on adequate infrastructure, professional training, and continuity. Integrating science, practice, and policy is the path to success.

ensure that the benefits of resistance training are accessible to all, consolidating it as a tool for inclusion and public health.

## 7. Challenges and future perspectives of inclusive resistance training

Despite scientific advances and growing recognition of the importance of resistance training for older adults and people with disabilities, significant challenges remain for its full implementation as an inclusive practice. One of the main obstacles is limited access to adequate spaces and equipment, especially in low-income communities or remote locations. Many exercise environments lack adapted resources or trained professionals, making it difficult for special populations to participate in training programs. According to Mendes and Costa (2016), the lack of ongoing policies and accessible infrastructure compromises the effectiveness of large-scale physical activity promotion initiatives.

Another challenge concerns professional training. Although Physical Education courses cover resistance training and special populations, there are still gaps in pedagogical practices that prepare personal trainers to deal with complex situations, such as adapting exercises for people with severe motor disabilities or comorbidities associated with aging. Studies by Fragala et al. (2019) highlight that ongoing training and scientific updates are essential to ensure the quality of interventions, but not all professionals have access to regular training. This limitation directly impacts inclusion, as it reduces the trust of clients and their families in the programs offered.

Social perceptions of resistance training are also a barrier. Many older adults still associate strength training with a high risk of injury, while people with disabilities face cultural stigmas that devalue their participation in physical activities. As Carvalho and Marques (2017) point out, prejudice and lack of information hinder adherence, even when programs are accessible. In this sense, awareness campaigns and the dissemination of scientific evidence are fundamental strategies for transforming social perceptions and expanding the reach of inclusive training.

From a scientific perspective, there are still gaps to be filled. Although meta-analyses confirm the effectiveness of resistance training in special populations (GRGIC et al., 2017), many studies present small sample sizes or specific contexts, making generalization of the results difficult. Longitudinal studies evaluating the effects of long-term programs on different types of disabilities and on older adults with multiple comorbidities are lacking. This limitation reinforces the need for greater investment in interdisciplinary research that combines Physical Education with medicine, physiotherapy, and social sciences.

On the other hand, the future outlook is promising. Technological advancements, with physiological monitoring devices and personalized training apps, open up new possibilities.

possibilities for individualization and remote monitoring. Furthermore, the growing appreciation of inclusive practices in public policies and private institutions tends to expand access and integration of older adults and people with disabilities in resisted programs. As Hackett et al. (2019) point out, the combination of science, technology, and inclusion can lead to a new training paradigm, characterized by personalization and a focus on comprehensive health.

Thus, current challenges do not diminish the relevance of inclusive resistance training, but rather indicate paths for evolution. The future points to an increasingly integrated, interdisciplinary, and accessible practice, in which the personal trainer will play a central role as a mediator between science, technology, and inclusion. Overcoming these barriers will consolidate resistance training as an instrument not only for individual health but also for social transformation.

## Conclusion

Resistance training represents a highly relevant scientific and practical intervention for promoting the health of older adults and people with special needs. Throughout this article, we found that its physiological effects include preserving muscle mass, bone density, and functional capacity, while its cognitive and social impacts include improving self-esteem, memory, and community integration. The analysis also highlighted that the role of the personal trainer goes beyond prescribing exercises, consolidating their role as an agent of inclusion and public health, capable of adapting protocols and promoting accessible and motivating environments.

The integration of strength, mobility, and quality of life reinforces that training should not be restricted to aesthetic or performance goals, but rather understood as a tool for autonomy and citizenship. Furthermore, public policies and community programs expand the reach of these practices, democratizing access and ensuring that their benefits reach the most vulnerable populations. In this sense, periodization and protocol adaptation should be seen as strategic resources to maximize results and reduce risks.

However, challenges remain numerous, ranging from structural barriers to social stigma and scientific gaps. Continuous personal trainer training, social awareness, and strengthening interdisciplinary research are essential steps to overcoming these limitations.

Future prospects, supported by technology and inclusive policies, indicate a promising path in which resistance training will be increasingly integrated into public health and social inclusion.

It can be concluded, therefore, that inclusive resistance training is more than just a physical exercise practice: it is a strategic resource for promoting health, quality of life, and social equity. By aligning science, practice, and inclusion, the personal trainer plays a decisive role in building a healthier and more just society, where strength and autonomy are accessible to all.

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