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RESEARCH ARTICLE

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ABSTRACT

The study presented is a way of raising the awareness of the elderly population, showing an option of physical activity and quality of life. The objective of this study was to identify from the scientific publications the benefits found in functional training for the elderly. We used as a methodology the literature review where a bibliographic search was carried out using the following descriptors: Aged, Aging, Physical Exercise, Functional Training, used as data source the works available in Scientific Electronic Library Online (SCIELO) and LILACS in the portal of the Virtual Health Library (VHL) in the period between 2010 to 2018. The results indicate that functional training provides benefits regarding physical fitness related to health, maintenance and gains in functional capacity, as well as increased lean mass, strength in the lower limbs and increased postural stability. They also point to improvement in self-perception of quality of life, physical performance, decrease in fat mass and visceral fat, muscular power, balance and flexibility. Functional training based on a structured exercise program is effective and can be an effective and safe strategy for elicit adaptive responses related to functionality and against age-related declines. We conclude from this study that functional training demonstrated that it is an effective mechanism against low functional capacity and is therefore an alternative of safe, low cost physical training with a positive impact on muscle mass, strength and muscular power, cardiorespiratory resistance, flexibility, balance and cognition. In the aging process, inactivity is considered to be harmful to the elderly and may accelerate the decrease in functional capacity. However, among the benefits found, it is suggested that a gradual increase in strength, muscular endurance and decrease in falls occur.

Key words: Elderly, Aging, Physical exercise, Functional training.

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INTRODUCTION

According to the World Health Organization (WHO), aging reflects an individual, cumulative, sequential, irreversible non-pathological process common to all and defines as elderly people 65 years of age or older (STOCCO, 2017, NAVES, 2012). The Brazilian Institute of Geography and Statistics (IBGE) states that in 2020 the population of elderly people in Brazil will be approximately 13%, as the increase in the chronological age is observed, as well as the inactivity and the appearance of chronic degenerative diseases (ARGENTO, 2010). Aging is a process that causes changes and wear in various functional systems, differentiate themselves from one individual to another such as, for example, physiological changes, malfunctioning of some body structures, reduced vitality, sensory changes, bone diseases, cardiovascular diseases and diabetes (Nunes, 2018 and OLIVEIRA, 2010).

According to Carvalho, Mendes and Araujo (2014), this process also differ in relation to pathological cases and environmental influences and can be characterized as primary and secondary. Primary aging are changes due to chronological time and secondary aging is associated with external influences, environmental stress and disease. Some degenerative diseases accompany the aging process such as osteoporosis, osteoarthritis, hypertension, among others that may affect functional capacity, loss of muscle strength in the lower limbs (LMW), negative influence on balance and gait quality causing a risk of falls by bone demineralization typical of the elderly (NAVES, 2012). According to Silva (2018) functional, biochemical, psychological and physiological musculoskeletal changes added to diseases lack physical exercise and the regular use of medications may limit the functional capacities of the elderly. Biological processes due to aging seem to be gradual due to intrinsic and extrinsic influences, having as variables both genetics and lifestyle.

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Muscular weakness denotes negative interference with mobility and autonomy, these deficits are related to nervous system changes, ie, reduction of muscle strength, slower reaction time, balance difficulties, and levels of dependence. simultaneously, throughout the body, exposing the elderly to greater vulnerabilities (Silva, 2018, Carvalho, 2014 and Stocco, 2017). Regular physical activity in the elderly reduces the risk of many adverse health effects by increasing life expectancy associated with health and well-being (NUNES, 2018). Physical exercises in general can bring some benefits by minimizing the losses inherent in this aging process, progressively helping the psychological, mental and social aspects, combating physical inactivity, contributing to the maintenance of the elderly physical fitness, improving the organic and cognitive abilities, its advantages depend on how aging is performed and the routinely performed exercises, since physical activity has been indicated so that this process can be minimized or delayed, although the challenges are still great to reduce the inactivity of the the elderly population (Oliveira *et al.*, 2010; Stocco, 2017; Argento, 2010).

According to Brandalize *et al.* (2011), the main benefits of regular physical activity are reduced risk of cardiovascular disease, hypertension, osteoporosis, obesity, reduced risk of falls and injuries. Interventions performed according to an exercise program may improve the balance, muscular strength of the lower limbs and the flexibility required in the daily life of these elderly people (SÁ, BACHION and MENEZES, 2012). Functional training (TF) is a systematized method of multifunctional exercises that are based on the application of integrated exercises, multi-articular and multiplanar, with the main objective to improve the quality of movement, strength of the central region of the body, adapting if the specific need of each person (NETO *et al.*, 2016).

The TF incorporates the goal of increasing strength along the muscular chains of the body, establishing the principle of functionality, performing integrated movements that imply acceleration, deceleration and stabilization of movement ability, neuromuscular efficiency and strength of the trunk region, improve the functional capacity, since they stimulate the proprioceptive receptors increasing the efficiency of the movements, agility and motor coordination, mainly in the daily tasks that may require levels of strength (Nunes, 2018, Carvalho, 2014 and Stocco, 2017). The TF can minimize the functional disability and can contribute to reduce the emotional problems attributed to disability, favoring improvements in the quality of life in an integral way, highlighting the benefits and their repercussions in this phase of life (Lustosa, 2010; Silva, 2018). Functional capacity suggests that the physiological competence can perform the activities of daily life (ADLs) with autonomy and independence, and the declines of these capacities are referred to by the loss of efficiency of the cardiorespiratory, neuromuscular and osteoarticular systems (NETO *et al.*, 2016).

Quality of life refers to whether people's perception of their position in life, culture context, value system as well as the physiological functioning or maintenance of activities of daily living, in the elderly prevail the ability to maintain autonomy, independence as perception of well-being present (OLIVEIRA *et al.*, 2010).

Goal: To identify the main benefits found in functional training for the elderly.

MATERIALS AND METHOD

This is an integrative review of literature on functional training for the elderly and its benefits, developed based on material already made, consisting of Scientific Articles, Master's Thesis and Course Completion Work. For the bibliographic search, the works available in the Scientific Electronic Library Online (SCIELO) and LILACS databases were used as data sources in the Virtual Health Library (VHL) portal. The descriptors used for the search were: Aged, Aging, Physical Exercise, Functional Training. Included in this research were the works available in full in the Portuguese language of Brazil, published in the period between 2010 to 2018. They were established with inclusion criteria after reading the titles and abstracts the complete works written in Portuguese language, being selected 11 articles with studies consistent with the topic addressed. The exclusion criteria used were works written in a foreign language, which escaped the proposed theme and those that did not have the full texts available in the online databases.

DISCUSSION

The elderly who performed the functional training (TF) presented better physical, emotional and physical function in the daily activities, the benefits in the body composition evidenced decrease of the visceral fat percentage, a significant increase of the isometric strength of the lower limbs and balance in the platform of strength (NUNES, 2018; SÁ, 2012). The regular practice of physical exercises promotes benefits as a physiological, psychological and social improvement besides the prevention of some diseases such as osteoporosis and deviations in posture. The physical activities practiced regularly by the elderly reveal less number of depressive cases due to the great socialization where new friendships and interests arise. From the standpoint of quality of life, favorable effects on balance, decrease of falls and fractures denote a greater independence and autonomy in the day to day. It suggests that specific training programs in the modalities of exercises and activities for the elderly that may impact on the control of their health, suggesting a balance between physical and psychological maintaining their social integration, aging can affect directly in the control of functional health and quality of life of these elderly people (ARGENTO, 2010).

The author understood that a TF program with the combination of several modalities of physical exercises reduce the number of falls among the elderly, even with the divergences of the health situation of this population. The interventions showed improvement in balance, muscle strength of the LLL and multi-articular flexibility (SILVA, 2018). The TF in the third age is through functional and cognitive morphological adaptations. Sarcopenia is characterized by reduction in the number of muscle fibers, loss of motor units, increase of non-contractile tissues that generate motor disabilities in the elderly. It is believed that functional training generates positive stimuli for conditions to gain muscle mass and reduce body fat deposits, the progression of these variables and the regular practice of functional exercises can aid in the performance of activities of daily living (ADLs) *et al.*, 2016). According to Silva (2018), the aging process is related to the intrinsic and extrinsic factors of everyone with gradual loss of the psychosocial dimensions reducing physical and sociability capacities. Well-designed training meets the criteria of functionality, structuring the exercises that permeate the

Table 1. Relationship between the descriptors and articles found in the Scientific Electronic Library Online (SCIELO) and LILACS database between 2010 and 2018

Descriptor	Articles Found	Selected articles	Sample
Old man	20174	09	03
Aging	22101	13	02
Physical exercises	23631	12	02
Functional training	11239	18	04
Total	77145	52	11

Table 2. Articles collected in the Scientific Electronic Library Online (SCIELO) and LILACS databases on integrative literature review between 2010 and 2018

Article Title	Authors	Results	Conclusion
1. A influência do treinamento força sobre as capacidades funcionais de indivíduos idosos	Carvalho D.C.de et al.	There were significant improvements in physical valences such as muscle power, balance, flexibility, maximum strength that interfered directly against low functional capacity in the elderly.	Functional training (TF) demonstrated an effective mechanism for the improvement and maintenance of autonomy in the elderly.
2. Qualidade de vida em Idosos que praticam atividade física – uma revisão sistemática:	Oliveira A.C.de, et al.	The study demonstrated that there is limited evidence regarding the benefits of TF programs that can infer the quality of life of the elderly.	Note that there are few studies on the efficacy of physical exercises that
3. Treino funcional para idosos	Stocco M.R.et al.	Sugere os aspectos mais relevantes do TF e sua aplicabilidade na população idosa, bem como suas vantagens, desvantagens e cuidados.	lifeoftheelderly.
4. Efeitos do treinamento funcional na mobilidade de idosos	Naves J.C.T et al.	The applied TF was quite effective in improving the functional autonomy, in the balance and in the performance of the activities of daily living (ADLs), of the motor activities and its applicability directed to sessions of stretching, muscular activation, neuromuscular and cardio metabolic. TF being a safe tool to improve the mobility of the elderly.	It is concluded that the TF when well planned improves the mobility of the elderly being a good prophylactic strategy against the decline of functional capacity, cardiorespiratory resistance, balance and cognition.
5. Exercício físico para prevenção de quedas: ensaio clinico com idosos institucionalizados em Goiânia,Brasil	Sá A.C.A.M, et al.	The results showed a decrease in the number of falls, significant differences in the muscular strength of LLL, and flexibility of movement after the physical exercise program.	The study concluded that the intervention performed with an exercise program was shown to be adequate for the improvement of the balance, muscle strength of LLL, contributing to the reduction of the number of falls among the elderly.
6. Treinamento funcional Vs. Hidroginástica: benefícios para aptidão física em idosos ativos.	Nunes C.R, et al.	He presented significant improvements to the mental health dimension, better physical physical performance, physical function and body pain, positively presented benefits in body composition, significant increase in the strength of the LLL and postural stability.	The following conclusions of the study on the quality of life of the elderly showed benefits of TF in self-perception of health status, physical fitness, emotional physical performance, decreased visceral fat and increased lean mass.
7. Benefícios da atividade física na saúde e qualidade de vida do idoso	Argento R.de S.V, et al.	The studies demonstrated results of some exercise modalities and activities for the elderly. The TF included aerobic, localized exercises, stretching, flexibility and muscular strength that contributed to the maintenance of the functional capacity and autonomy of the elderly.	It was concluded that in the aging process, inactivity is considered to be harmful to the elderly, which may accelerate the decrease in functional capacity. The practice of continuous and regular physical activities may benefit from gradual increase in strength, muscular endurance and decrease of falls.
8. Efeito de um programa funcional no equilíbrio postural de idosos DAC comunidade.	Lustosa L.P, et al.	The results evidenced an improvement in the ability to perform ADDs, improvement in static unipodalbalance, balance gain, flexibility and muscular strength with greater impact on mobility, reducing functional dependence.	It was concluded that the functional exercise program generated significant improvements in the performance of ADLs.

9. Treinamento funcional para idosos: uma breve revisão	Neto A.G.R, et al.	As a result, it was observed that the interventions that contained exercises of strength, cardiorespiratory resistance and balance show to be strategies more indicated for improvement in the quality of life ..	It was concluded that functional training proved to be a safe, low-cost training with a positive impact on muscle mass and muscle strength.
10. Efeitos de diferentes programas de exercícios físicos na marcha de idosos saudáveis	Brandalize D, et al.	It was observed that balance can affect the health and functional independence of the elderly, thus increasing the risk of falls and fractures. TF may be beneficial in improving performance regarding strength, coordination, flexibility as well as balance.	The study concludes that the functional activities that require the physical valences have found positive results in all its context and that an exercise program will benefit the performance of the ADLs and autonomy of the elderly.
11. Benefícios do treinamento funcional para o idoso: uma revisão bibliográfica	Silva C.J, et al.	There have been significant improvements in some components of physical fitness such as strength and muscular endurance. The balance and the cognitive aspect presented positive results, being recommended the TF for the elderly, still considering an improvement of the self-image and self-esteem responsible for psychological benefits.	The TF showed an alternative to exercise the elderly, since it consists of multiplanar, multiarticular movements integrated to diversified exercises, optimizing the body composition and rescuing the functional capacity with greater autonomy in the ADLs.

CARVALHO D.C.de et al(2014); OLIVEIRA A.C.de, et al (2010); STOCOCO M.R.et al (2017); NAVES J.C.T et al (2012); SA A.C.A.M, et al (2012); NUNES C.R, et al (2018); ARGENTO R.de S.V, et al (2010); LUSTOSA L.P, et al (2010); NETO A.G.R, et al (2016); BRANDALIZE D, et al (2011); SILVA C.J, et al (2018).

variables required to maintain the functional capacity of the elderly. Physical fitness, body composition, mobility, balance, functionality, calf balance and cognition are associated with TF and thus a significant improvement in the ability to perform ADLs. Both strength training and functional tasks can contribute to performance, as the capacities for coordination, balance, flexibility and strength will be improved, improving the gait performance of the elderly. As the author suggests, the walking programs, stretching exercises contribute to the reduction of falls because they are excellent therapeutic modalities (BRANDALIZE *et al.*, 2011). In order to maintain an active quality of life, the author suggests the stimulation of several functions of the organism related to physical activities, essential in maintaining the functions of the locomotor system responsible for the performance of ADLs, autonomy and independence of the elderly. It also identifies a program of exercises that will improve their health status, often sedentary, suggesting muscle strength training combating weakness and muscle weakness, weight training to assess flexibility, coordination, dynamic balance and strength endurance. TF works with exercises that can stimulate proprioceptive receptors, stimulating the motor control system, reducing muscular imbalances and the incidence of injuries (NAVES, 2012).

Adequate levels of muscular strength and flexibility are determining factors in the execution of the movements necessary to perform the ADLs. The application of TF in the elderly population demands some guidelines such as the use of materials, advantages, disadvantages, care, number of training sessions with structured exercises that can attenuate the declines related to aging, promoting health promotion and improvement in the quality of life (STOCOCO, 2017). According to Oliveira *et al.* (2010), the use of combined exercises such as aerobic training, strengthening of coordination exercises, specific exercises with TF and resistance exercises make up a complete TF program that shows the effectiveness of these interventions in quality of life when they participate in physical activities routinely. The author reports in his study that functional capacity differs between men and women and that although women have a higher life expectancy, they have the highest rates of functional physical dependence in relation to men. The combination of different variables such as intensity, frequency, training volume, number of sets, rest intervals demonstrate equal efficiency in the achievement of the goals set, since poor conduction of the cardiopulmonary

resistance training process tend to influence by changing the transport mechanisms and use of O₂, positively affecting this variable present in the TF. Balance, flexibility and cognition are also an integrative part of functional exercises aimed at promoting the health of the elderly (CARVALHO, MENDES AND ARAUJO, 2014). Lustosa *et al.* (2010) demonstrates that after the program significant results related to ADLs were presented, which consequently impacted mobility and daily tasks, and suggested that criteria should be adopted to maintain the continuity of functional training programs.

Conclusion

It was concluded that the gait performance of healthy elderly people is an essential ability to perform ADLs and independence of the elderly. TF when well-planned improves the mobility of the elderly being a prophylactic strategy and to improve the quality of life. Physical exercises, health promotion, improvement in the quality of services and the intervention of the exercises in front of the TF, promote the physical fitness generating interventions for greater autonomy and quality of life of this population. In relation to TF and muscle strengthening exercises, there is no evidence regarding its efficacy in the quality of life of the elderly living in the community. Significant improvements in physical strength, balance, flexibility and aerobic capacity have been shown to be an effective mechanism for the improvement and maintenance of the independence and autonomy of the elderly, thus modulating the health and quality of life of the elderly.

TF should increasingly be integrated into the training programs of older people so that they can contribute to the improvement of health status, body composition, strength and balance. Functional training includes multi-articular, multi-articular movements integrated with diversified exercises where strength, endurance, balance, flexibility, cardio respiratory resistance and cognitive function can be trained, maintaining or rescuing functional abilities and autonomy in ADLs. self-image, self-esteem contributing with psychological benefits of the elderly. The practice of physical activities must happen in a continuous and regular way so that greater autonomy of the ADL can be achieved. It is understood that the process of aging and inactivity are considered harmful to the elderly, since they can accelerate the decrease of functional capacity, however the benefits are the gradual increase of muscular strength and endurance and the decrease of falls.

Functional training seems to be one of the alternatives of safe physical training, with a positive impact on muscle mass and strength, and can be implemented in health promotion programs for the elderly.

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