92 - THE BENEFITS OF STRENGTH TRAINING ON CHANGES OF PHYSIOLOGICAL SYSTEMS ASSOCIATED HEALTH IN THE THIRD AGE

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Introduction

According to Rosa Neto et al. (2009, p. 9), "Population aging is a fact crucial, as the elderly population worldwide is the fastest growing group."

Rebelatto et al. (2006) suggests that sedentary lifestyle associated with lower consumption of food and other changes that occur with aging (less mobility and intestinal absorption, altered metabolism of carbohydrates, calcium, iron and micronutrients) can determine malnutrition or, at least, vitamin deficit or mineral.

According Paixão (2012), strength training should be part of a lifestyle that develop physical fitness permanently. There is need for continuous reassessment of objectives and planning the program for optimal results.

The transformations that occur in the body with increasing age and declining strength are seen by many people as barriers and bring motivation to the individual, but it should be emphasized that these changes are normal in everyone's life and that each individual must adapt the best way possible.

Taking as reference the old universe and everyday situations that surround it, this paper aims to analyze the degenerative process and the loss of strength with increasing age; highlight the importance of a physical assessment to establish early preventive strategies and evaluating possible health risks with emphasis on physical exercise and strength training for individuals in this age group; demonstrate the need for a life of active physical activity, whereas metabolic responses and structural and functional modifications collaborate with expectations of an improvement in the performance of daily activities and contribute to the so-called "successful aging."

It was established as a research method the authors of literature review related theme. To do so, we employ a search strategy using keywords contained in the title of the studies. The keywords were: strength training, healthy aging and sedentary lifestyle.

Third Age

According to Teixeira (2012), regarding the term elderly, several literatures say that there is no single definition of the concept of age or older, that because there is no consensus on what is called old age, because the chronological divisions of life human are not absolute and do not always correspond to the stages of the aging process. That is, old age is not definable by simple chronology, but the physical, functional, and mental health.

Chronological age adopted the National Policy for the Elderly (Law No. 8.842/1994) considers all individuals aged "over 60 years old." (BRAZIL, 2012)

According to Rodrigues (2006), who makes the chronological milestone is the individual, not tables or graphs. A person may have 50 years and now appear aspects of an elderly (seniors), but there are people who at age 80 is still young present. The term "elderly" is therefore only one parameter life expectancy.

Age Rating

Following the study by Shepard (2003), yields an objective basis for the rating, where individuals may lie in the categories middle age, old age, old age advanced and very advanced age.

According to research conducted at the National Center for Health Statistics of the U.S. (1993 apud SHEPARD, 2003), much of the damage to health is because of disability, injury or disease, which occurs in old age. In a typical scenario, an elderly person spends about 10 years in the category of advanced old age, where there is an increasing limitation of physical abilities, and about a year at a very advanced age, where the same survey reports that in the best of possibilities, there a severe limitation of physical activity and, commonly, total disability. Because women survive for a longer period than men, they typically experience a longer period of partial or total failure (SHEPARD, 2003).

Sedentary

Inactivity is defined Barros Neto (2009) as the lack, absence and decreased physical activity and sports, and is already considered as the disease of the century, because it is a behavior-induced habits arising from the comforts of modern life. The concept is not necessarily linked to the lack of a sports activity, but to the individual who spends fewer calories per week with occupational activities.

Barros Neto (2009) cites a study by students at Harvard University, where the weekly caloric expenditure determines whether the individual is sedentary or active. To no longer be part of the group of sedentary individuals need to spend at least 2,200 calories per week in physical activities.

Palma (2009) cites that in the specialized bibliography, you can find researchers argue that the associations between regular exercise and physical reduction of osteopenia and osteoporosis, diabetes mellitus, hypertension, obesity, depression and anxiety and even reduction of all cause mortality, thus contributing to increased longevity.

A sedentary lifestyle causes the disuse of functional systems, since the locomotor system and other organs and systems used during physical activity enter into a process of regression functional, featuring, in the case of skeletal muscle, a phenomenon associated with atrophy of muscle fibers, loss of joint flexibility, in addition to functional impairment of various organs (BARROS NETO, 2009).

The practice of regular physical activity is indicated for treatment of patients with chronic diseases such as coronary heart disease, hypertension, dyslipidemia, diabetes, obesity and chronic obstructive disease, because the physical training is considered a safe form of intervention.

Physiological changes in aging

These changes occur at the cellular level, tissue, and organic systems. Each compartment undergoes natural changes in his time as a result of intrinsic and extrinsic assaults that lead to decreased respiratory reserve, the decline of defense

systems and adaptation to the environment, and make a person more susceptible to illnesses. These changes occur early on although little noticed, but in the elderly is that these changes become visible. When the elderly presents some illness in parallel, these changes become more evident (ANDRADE, 2012).

Amendment musculoskeletal – Sarcopenia

"The degenerative process of the body becomes stronger after 60 years, bringing as a consequence, a significant decrease in muscle mass and strength" (PAIXÃO, 2012).

It has been suggested that the decrease in muscle mass is the main factor for the reduction in strength with increasing age. This decrease was called sarcopenia (EVANS; CAMPBELL, 1990 apud FLECK; KRAEMER 1999).

Matsudo et al. (2003) reported that between 25 and 65 years of age there is a decline of 10 to 16% lean body mass or fat free mass due to loss of bone mass in skeletal muscle and total body water as a consequence of aging. This gradual loss of muscle mass and strength that occurs over the years is known as sarcopenia.

Age alone does not seem to affect the quality of muscle contractions when this is balanced by muscle mass. This statement confirms the fact that the main factor reducing the strength with age is sarcopenia (FRONTERA et al., 2001).

As one grows older, there is a general trend in reduction of muscle mass. It seems that this effect on muscle mass depends on the location of the muscles (upper vs lower limbs) and function (extension vs. flexion) (FRONTERA et al, 2001).

According Passion (2012) it is believed that when the body weight is constant over the years, it is possible that some degree of sarcopenia is occurring because studies have demonstrated changes in body composition (body fat increase muscle mass and reduced).

Osteoporosis and Osteopenia

Marques Neto (2012) defines osteoporosis as a bone loss greater than 2.5 standard deviations from a normal curve, measured in the study population opened by densitometry. Osteopenia is the term used to refer to any condition involving a reduction of saline (in terms of age) the total quantity of mineralized bone. Osteopenia is considered as being placed at zero but less than 2.5 standard deviations, measured by densitometry.

Reduced bone mineral density (BMD) that occurs with aging, can lead to the development of osteoporosis, increasing the risk of falls and therefore fractures in both sexes. It is the most common of all diseases related to bones in adults, especially in elderly individuals. The main causes are: vitamin D deficiency, lack of physical stress on the bones due to inactivity, malnutrition, lack of estrogen secretion and Cushing's syndrome (excessive secretion of glucocorticoids that reduce protein deposition and depresses the activity of bone cells) (Guyton; HALL, 2006).

Paixão (2012) points out in his article that promotes a sedentary lifestyle and aging, bone health, a decline in bone mineral density (BMD). The DMO is characterized as the maximum amount of bone achieved during life, in a given space, or the total mineral content. Osteoporosis, meaning porous bone, is a systemic skeletal disease characterized by decreased bone mineral density and their deterioration, increasing the fragility and susceptibility to fractures.

Therefore, it is necessary to differentiate adequately the terms Osteoporosis and Osteopenia, because according Marques Neto (2012) Osteoporosis and Osteopenia is a condition, not often, since both conditions can be diagnosed early and avoided or mitigated through programs prevention.

According Paixão (2012), it is believed that exercise causes increase BMD, and muscle mass (hypertrophy) from Micro lesions "necessary" caused by exercise. With aging, the loss of strength is greater in the lower limbs than upper, and that with strength training, this gain is greater in the lower limbs than in the upper limbs.

Obesity

Obesity is defined with an excess of adipose tissue (fat) in the body, caused by large intake of calories with little energy expenditure (GUYTON; HALL, 2006).

For Marco (2006), obesity is a complex disease resulting from factors related to the behavior, the environment and also genetic factors, which may influence individual responses relating to diet and physical activity.

It is understood that overeating and physical inactivity in combination with genetic factors are the major causes for the development of human obesity.

According Matsudo et al. (2003), the two areas of priority strategies for prevention, control and treatment of obesity are increasing the level of physical activity and improved diet quality. The most important in terms of increasing the level of physical activity is the stimulus to avoid sedentary habits and the adoption of an active lifestyle.

Andrade (2012) sayd when starting a treatment for weight loss, it is necessary that the first patient to lose a few pounds later, now more satisfied and willing with pounds lost starting an exercise program. Moreover, when leaving the exercises to a second phase in slimming the risk of injuries to joints, ligaments and muscles becomes much lower than when the patient presents with "many kilos" more. The overhead of the cardiovascular condition of this reduced weight, will also be much less aggressive.

Diabetes

Diabetes is a metabolic syndrome of multiple origin, caused by lack of insulin and / or the inability of insulin to properly exercise its effects. Insulin is produced by the pancreas and is responsible for the maintenance of glucose metabolism. The lack of this hormone causes deficits in glucose metabolism and consequently diabetes. It is characterized by high levels of blood glucose (hyperglycemia) permanently. (BRAZIL, 2012)

Bisan (2010) cites that no one questioned or put in check the benefits that exercise can bring to people, especially if they are well monitored, can achieve great changes in the body and in the treatment of diabetes.

Hypertension

Ferracioli et al. (2012) report that the constant demand to physical activity for the alleviation of symptoms related to several pathologies and in the specific case of hypertension, for the elderly, has prompted some scholars to investigate the effects of practice resistance exercise on such evils.

According Forjaz et al. (2003 apud FERRACIOLI, 2012), there has been increased interest regarding the cardiovascular effects with respect to resistance exercises. Given the above yet, you should propose a specific resistance exercise training for hypertensive patients, with the goal of improving quality of life through strength gain, having this kind of work a hypotensive effect.

Application of Strength Training

According to Fleck and Kraemer (2006) the process of developing a program of strength training in older adults is to assess, in determining individual goals in program planning and development of evaluation methods. For seniors, strength training should be part of a lifestyle linked to conditioning over time, and the ongoing reassessment of objectives and program planning is required to achieve optimum results and adhesion.

The low-intensity exercise, such as walking and aerobics, are indicated, however, moderate weight training is the most appropriate activity for elderly to strengthen bones and muscles fully. A current concept in geriatric rehabilitation is to not recommend walking for frail elderly, before a program of muscle strengthening with weights, in order to avoid serious falls and fractures (SIMON et al., 2012)

Muscular Strength

According to França (2012), muscle strength is the force or torque that a muscle or muscle group can generate in particular or specific speed. We also have to define that strength is the maximum amount of tension that a muscle or muscle group can produce a specific pattern of movement performed in certain speed.

Shepard (2003) suggests that strength is an important daily activity for the elderly because it reflects factors such as improved coordination and greater neural activation. Through it, the elderly can keep longer, functional abilities, not losing their autonomy.

Muscle strength and physical ability is why a person is born with it and just develops throughout life. By train it can all become stronger as we won the stimuli applied. The force manifests itself in some ways as absolute strength, strength endurance, explosive power and strength hypertrophic (FRANÇA, 2012).

The Use of Strength Training for Seniors

Medeiros (2012) cites that with strength training, some psychological aspects are significantly improved. We can cite the improvement in self-concept, self-esteem, body image, reduced anxiety and stress, decrease muscle tension and insomnia, decreased drug use, improves cognitive function and socialization.

Cortêss and Silva (2005) make it clear that training does not prevent a person age nor prevents loss of strength, but you can minimize this loss and its impact on the day-to-day lives of older people.

Paixão (2012) cites that prove to gain strength tests were performed in the elderly and found that in training programs of high and low intensity, there were significant gains in strength. The ability to increase muscle strength is preserved in the elderly. These results were obtained only through testing in training programs of high intensity strength, therefore, to develop a good program of strength training for seniors, must prioritize individualized, customized to meet the changes in functional capacity respecting their individual health conditions.

Strength training program

Older people can tolerate the exercise of high intensity strength (ie, 80% of 1RM), which results in positive adaptations. Some data indicate that the intensity must be carefully applied so as not indicate a syndrome on training in older adults. It is quite possible that the recovery from a training session last longer in older people and that the use of varying intensities in a periodized format allows optimum adaptation (FLECK; KRAEMER, 2006).

Simão et al. (2012) reminds us that strength training should be used exercises that can be performed without breath blocked because exercises like push-ups in suspension and push-ups in support without additional aid are not suitable for the elderly.

Benefits of strength training

Simão et al. (2012) describes that physical exercise is considered today as one of the best ways to maintain the quality of life during the aging process, exerting favorable influence on the functional condition of the organism and on its ability to perform.

According Ambrosine et al. (2012), the deterioration of normal physiological function with age may be attenuated or reversed with regular strength training. The benefits of participating in a regular exercise program include a better profile of risk factors such as HDL-cholesterol higher and lower blood pressure.

Andrade (2012) cites some benefits acquired with strength training. They are burning calories and weight loss, maintenance of muscle toning, increased metabolic rate (the amount of calories that your body burns 24 hours), improvements in the circulation, an improvement in cardiac function and lung, increased self-control, stress reduction, increased ability to concentrate, improved appearance, reducing depression, decreased appetite, improved sleep quality and preventing diabetes, blood pressure and cholesterol.

The studies of Simão et al. (2012) also showed that elderly people aged practicing jogging or swimming, have the same levels of muscle hypertrophy found in sedentary elderly. Rather, they age elderly practicing exercises with weights preserved muscle mass.

Conclusion

Based on this article may be concluded that a program of strength training for seniors allows gain muscle mass, but the main change only happens in performance improvement related to the strength and flexibility, balance, coordination, agility and posture, for better performance with these skills becomes possible for seniors perform day-to-day they have been limited due to age and the consequences of a sedentary lifestyle.

Considering the quotations submitted, strength exercise for seniors, regularly and accompanied by a highly qualified professional to perform the correct orientation of application, is a key component to minimize the detrimental effects of aging, prevent and assist in the treatment of diseases related thereto.

Strength training should be an integral part of prevention and rehabilitation programs for the elderly. This is an important area for future intervention in an attempt to prevent the development of disease and disability in the elderly.

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THE BENEFITS OF STRENGTH TRAINING ON CHANGES OF PHYSIOLOGICAL SYSTEMS ASSOCIATED HEALTH IN THE THIRD AGE

ABSTRACT

Statistical data show that the population of aged Brazilians is growing each year and that several factors in these people's daily lives contribute to the loss of muscular strength with age. The aim of this paper is investigate and analyze through bibliographical references, the benefits and limitations of Strength Training for individuals in more advanced age groups and the importance of physical activity for such age groups to help ease symptoms of osteoporosis, Diabetes Mellitus and obesity. During recent years the benefits of such Strength Training during the ageing process has been proven. In fact, some investigators have shown that some individuals of over 90 (ninety) years of age can still obtain an increase in strength capacity during a training period of just eight weeks, which results in better functional capacity and thus also an improvement in quality of life. The first research based on training for older people was focused largely on the concept of preventing the wasting of muscle mass and age-related loss of strength. As a result and by default, low-intensity training was a favorite option, thus ruling out a priori any possibility that an older person could withstand, or even benefit from, higher-intensity sessions of Strength Training. Many reasons were brought forward to support this stance, but very little research was actually carried out, and virtually nothing was known about how the organisms of older people react when subjected to a program of Strength Training of whatever intensity. Underscoring the importance of older people's adaptability to physical exercise, we find the resulting metabolic reactions and structural and functional changes lead to a better performance of day-to-day activities, and so Strength Training serves as a powerful instrument for the promotion of better health of older people a basic strategy to be considered in a process of healthy ageing.

LES AVANTAGES DE L'ENTRAÎNEMENT EN FORCE SUR LES CHANGEMENTS DES SYSTEMES PHYSIOLOGIQUES POUR LA SANTE ASSOCIES AU TROISIEME AGE

RÉSUMÉ

Les statistiques montrent que le nombre de personnes âgées au Brésil est de plus en plus chaque année et tous les jours de nombreux facteurs contribuent à la perte de la force musculaire avec l'âge. La présente étude a pour objectif d'étudier et d'analyser par le biais revue de la littérature, les avantages et les limites de musculation ciblée pour les personnes ayant un âge avancé et l'importance de l'activité physique chez les personnes âgées comme un moyen de soulager les symptômes de l'ostéoporose diabète sucré et l'obésité. Au cours de ces dernières années ont vu les avantages de l'entraînement en force au cours du vieillissement de l'être humain. En fait, certains chercheurs ont montré que les personnes âgées de plus de 90 (quatre vingt dix) ans peut obtenir une augmentation de la production de force au cours d'une période de formation de huit (8) semaines,

ce qui entraîne une amélioration de la capacité fonctionnelle et, partant, une meilleure qualité de vie. Premières recherches ont porté sur la formation des personnes âgées s'inquiètent seulement en ce qui concerne la perte de masse musculaire et la force musculaire associée à des subventions de vieillissement et a donc cherché à construire des formations, pour la plupart de faible intensité. Ce fait lui-même admet que les personnes âgées ne pouvaient pas effectuer des activités de résistance à haute intensité. De nombreuses raisons ont été soulevées, mais peu de recherches à ce sujet, et presque rien n'était connu sur les changements que le corps subit l'entraînement de force des personnes âgées, quel que soit son intensité. Soulignant l'importance en ce qui concerne l'aptitude à la pratique de l'exercice pour les personnes âgées, il peut être considéré que la réponse métabolique et modifications structurales et fonctionnelles collaborer avec les attentes d'une amélioration de la performance des activités quotidiennes, et sert comme un outil puissant dans la promotion de santé des personnes âgées, la stratégie fondamentale du vieillissement en bonne santé.

LOS BENEFICIOS DEL ENTRENAMIENTO DE FUERZA EN LOS CAMBIOS DE LOS SISTEMAS DE SALUD ASOCIADOS FISIOLÓGICOS EN LA TERCERA EDAD

RESUMEN

Las estadísticas muestran que el número de adultos mayores en Brasil está creciendo cada año y muchos factores cotidianos contribuyen a la pérdida de la fuerza muscular con la edad. El presente estudio tiene como objetivo investigar y analizar a través de revisión bibliográfica, los beneficios y las limitaciones de entrenamiento de fuerza específico para las personas de edad avanzada y la importancia de la actividad física en la tercera edad como un medio para aliviar los síntomas de la osteoporosis diabetes mellitus, y obesidad. Durante los últimos años han visto los beneficios del entrenamiento de la fuerza durante el envejecimiento del ser humano. De hecho, algunos investigadores han demostrado que las personas mayores de 90 (noventa) años pueden obtener un aumento en la producción de fuerza durante un período de entrenamiento de ocho (8) semanas, lo que provoca una mejora en la capacidad funcional y por lo tanto una mejor calidad de vida. Las primeras investigaciones se centraron en la formación de las personas mayores preocupado sólo en lo que respecta a la pérdida de masa muscular y la fuerza muscular asociada con el envejecimiento de las subvenciones y por lo tanto solicita a construir entrenamientos, en su mayoría de baja intensidad. Este hecho en sí mismo admite que los ancianos no podían realizar actividades de fuerza de alta intensidad. Hay muchas razones que se han planteado, pero poco se investigó al respecto, y casi nada se sabía acerca de los cambios que el cuerpo experimenta el entrenamiento de fuerza mayor, independientemente de su intensidad. Destacando la importancia con respecto a la aptitud para la práctica de ejercicio para las personas mayores, se puede considerar que la respuesta metabólica y modificaciones estructurales y funcionales colaborar con las expectativas de una mejora en el desempeño de actividades diarias, y sirve como una herramienta poderosa para promover salud del anciano, la estrategia fundamental de un envejecimiento saludable.

OS BENEFÍCIOS DO TREINAMENTO DE FORÇA SOBRE ALTERAÇÕES DOS SISTEMAS FISIOLÓGICOS ASSOCIADOS À SAÚDE NA TERCEIRA IDADE

RESUMO

Dados estatísticos mostram que o número da população idosa no Brasil cresce a cada ano e que diversos fatores cotidianos contribuem para a perda da força muscular com a idade. O presente trabalho se propôs a investigar e analisar através de revisão bibliográfica, os benefícios e as limitações de um treinamento de força objetivado para indivíduos com idades avançadas e a importância das atividades físicas na terceira idade como meio de amenizar os sintomas da osteoporose, diabetes mellitus e obesidade. Durante os últimos anos têm se verificado os benefícios do treinamento de força durante o período de envelhecimento do ser humano. De fato, alguns pesquisadores têm demonstrado que indivíduos com idade acima de 90 (noventa) anos podem obter um aumento na produção de força durante um período de treinamento de 8 (oito) semanas, o que acarreta uma melhora na capacidade funcional e, consequentemente, uma melhora na qualidade de vida. As primeiras pesquisas voltadas para o treinamento de pessoas idosas preocuparam-se apenas na questão relacionada com perda de massa muscular e da força muscular associada à idade e, consequentemente, buscavam subsídios para basear treinamentos, em sua maioria, de baixa intensidade. Tal fato admite por si só que o idoso não poderia realizar atividades de força em alta intensidade. Muitos motivos foram levantados, mas pouco se pesquisou a respeito, e quase nada se sabia sobre as modificações do organismo do idoso submetido a treinamento de força, independente de sua intensidade. Evidenciando a importância no que se refere à adaptabilidade a prática do exercício para idosos, pode-se considerar que as respostas metabólicas e modificações estruturais e funcionais colaboram com expectativas de uma melhoria do desempenho das atividades cotidianas, e serve como um instrumento poderoso na promoção da saúde do idoso, estratégia fundamental do envelhecimento saudável.