

## 104 - RESISTANCE TRAINING AND FITNESS CLASSES IN THE ELDERLY: A COMPARATIVE ANALYSIS THROUGH THE TEST GROUP OF LATIN AMERICAN DEVELOPMENT FOR MATURITY (LADM).

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### 1. INTRODUCTION

Nowadays bodybuilding is recommended for the maintenance of our body and can bring health gains and improved quality of life (QOL) (FLECK, SIMON, 2008). The so-called resistance training or resistance exercise, are usually carried out with weights, although there are other ways to offer resistance to muscular contraction. Bodybuilding is the term most often used to describe weight training, so, bodybuilding is not a sport but a form of physical training (SANTARÉM, 1999; HAKKINEN, 2001; MATSUDO, 2001; FLECK; SIMON, 2008; NOVAES, 2008; NIEMAN, 2011).

Neural adaptations are often dominant in strength training programs for people not trained or untrained, contributing primarily to early gains in strength and with little impact on gains in muscle mass (hypertrophy). All these neural adaptations are factors that distinguish a person with experience in strength training other than get involved with this type of practice (KRAEMER, 1996; GENTIL, 2008).

The adaptations of the nervous system can improve the central control of muscles (brain control) and increase motor responses (afferent and efferent systems). And such adjustment occurs by three (3) essential factors: the increasing number of motor units recruited, increasing the frequency of motor units, and reduced co-contraction (Agonist X Antagonist) (AMEREDDES, 1999; CUSSLER, 2003).

Given these adaptations for the elderly, interval training has as its main feature, switch according to the intensity and range energy systems that operate in our metabolism, which are subdivided into degree of intensity: alactic anaerobic, anaerobic lactic, and aerobic. The system being characterized by anaerobic alactic, the intensity should be maximal stimulus duration did not exceed 10-15 seconds, and the interval should be shorter than 1 minute and 30 seconds, the lactic anaerobic system must be submaximal intensity, the duration of the motion should be 30 to 60 seconds, and the recovery of 1 to 3 minutes, and the aerobic system has moderate intensity, the range is in accordance with the time spent in the incentive for example 1:1, and the number of repetitions per series should be within the range 10-15 movements and their recovery is active (MCARDLE, 1998; DANTAS, 2003; BOSSI, 2011).

The research presents general objective: To analyze and compare the functional capabilities, through the protocol of the Group of Latin American Development to Maturity (GDLAM) on elderly exercisers resisted the project "Physical Fitness, Health and Strength" made you read in and practitioners of design "Polo Sport SEDUC / NEL" general fitness.

Being divided into two (2) specific objectives are: a) Verify as an exercise training influence on the individual income elderly in their daily tasks, b) analyze how resistance training and functional influence on the functional capabilities of strength.

### 2. METHODOLOGY

The present study was subject elderly, residents of the metropolitan region of Belém do Pará participants of the projects developed by the university and used a sample of 25 subjects, 14 in Group you read divided by 11 women (78.57%) and 3 men (21.43%) and 11 in group Fitness, divided by 9 women (81.82%) and 2 men (18.18%), the research being conducted on the premises of the University of the State of Pará Having as coordinators of the project "Physical Fitness, Health and Strength" prof. Ms. Evitom correa de Sousa and prof. Dr. Vanderson Cunha. And another group of individuals participating in the project titled "Polo Sport SEDUC / NEL" fitness, having coordinated by prof. Dr. Moses Simon Santa Rosa. And were divided into two groups: the elderly who do strength training in the control group and the elderly who practice fitness classes in the experimental group.

The criteria for inclusion of subjects in the survey was first across the term Informed Consent Form (ICF) signed the elderly themselves. For inclusion of subjects in the study were: age of fifty (50) to seventy (70) years of age, of both sexes; classified as physically independent elderly, according to the classification of Spirduso (1995), were attending projects with at least six (6) months, submit a medical certificate to release to the practice of physical activity. Exclusion criteria are: having a maximum of two consecutive weeks of absences in the project.

Statistical data of the research were presented in tables and graphs and statistical treatment of the data was performed using the Statistical Package SPSS 18.0 where it adopted the descriptive statistics (mean and standard deviation) for sample characterization, and statistical inference via the t test Student to compare the means of the variables between the different sample groups. We adopted a significance level for statistical inferences of  $p \leq 0.05$ .

#### 2.1 PROCEDURES

This study will use as a base, the test protocol of the Group of Latin American Development to Maturity (GDLAM). Assessment tools for the application of the tests are: 01 Clock Timer (CASIO G-SHOCK), 01 chair with support (UNIMEC) with 45 cm seat height to ground, 02 colchonetes (FITCIA), 02 cones (ATHLETIC PLASTIC), 01 tape measure 7.5 meters (TRAMONTINA) and 01 shirt G (NIKE).

The same consist on five tests featuring questions as needed to evaluate their daily activities of an elderly person. The five tests were applied, respectively, in this order: walking 10 meters (C10M) (GUIMARÃES et al., 2008), stand up from a sitting position (LPS) (GUIMARÃES et al., 2008), getting up from the chair and move around the house (LCLC) (ANDREOTTI; OKUMA, 1999), rising from the prone position (LPDV) (GUIMARÃES et al., 2008), dressing and taking off his shirt (VTC) (MENESES et al., 2007). The protocol was applied GDLAM with this set of tests, because it has a good applicability, a similar relationship with the activities of daily living.

Walk 10 meters (C10M), the purpose of this test is to evaluate the speed that the individual takes to cover the distance of 10 meters in the room, and enclosed with ribbons this space (GUIMARÃES, 2008).

Up from sitting position (LPS), this test aims to assess the functional capacity of the lower extremity, the individual

gets up and sits five times consecutively, starting from a seated position in a chair without armrest, with the seat to a distance of 50 cm from the ground (GUIMARAES, 2008)

Getting up from the chair and moving around the house (LCLC), the goal is to evaluate the ability of the elderly on agility and balance. With a chair 50 cm, height of the seat to the ground in the same setting, whether to demarcate two cones diagonally to the chair, to a distance of four meters and three meters behind the right and left sides thereof. To mark the points where the cones were in place, we used a tape measure. When the individual must sign up, move to the right, circling the cone, return to the chair, sit down and take both feet off the ground, then immediately getting up and doing the same process for the left side, the individual must give two turns in each test to complete the cone (ANDREOTTI, OKUMA, 1999).

Getting up from prone position (LPDV) the purpose of this test is to assess the individual's ability to get up from the floor. The test consists of: starting from the initial position in the prone position on two mats placed on the ground, with arms along the body, the sign, the individual must stand up to her feet as quickly as possible (GUIMARÃES, 2008).

Wear and take off his shirt (VTC), this test aims to assess the functional upper limb by measuring the time required to take a dress and shirt. The individual should be standing with arms along the body and a shirt size "G" in one hand (the dominant hand). At the signal, he should wear a shirt and immediately withdraw it, returning to the starting position (MENESES, 2007).

From the testing are collected the data that are released in a formula LADM index (GI) which is expressed by the equation:

$$GI = \frac{[(C10m + LPS + LPDV + VTC) \times 2] + LCLC}{4}$$

And the scores can be categorized into concepts: Poor, Fair, Good, and Very Good According to the classification table:

CLASSIFICATION	GI (SCORES)
WEAK	+27,42
REGULAR	27,42-24,98
GOOD	24,97-22,66
VERY GOOD	-22,66

Frame 1 - Classification of Scoring by LADM index (GI)

Source: Pinto and Sousa, 2012.

Information collected in the survey will be used only for purposes of this research and publication of articles in which the subjects will be analyzed according to the provisions of Resolution 466/12 - CNS, following submission and approval by the Ethics Committee of the Centre for Biological Sciences and Health-University of Amazonia (UNAMA). Research participants must sign a Statement of Consent, which is the explanation of the study.

### 3. RESULTS AND DISCUSSION

Table 1 - Descriptive characteristics (mean ± standard deviation) of the sample variables LADM the two sample groups, and Student's t test between groups.

Variable	LERES	CF	T	P
<b>C10M</b>	5,39 ± 0,78	11,90 ± 1,24	-16,09	<0,01*
<b>LPS</b>	8,22 ± 2,19	9,69 ± 2,21	-1,66	0,11
<b>LCLC</b>	16,10 ± 1,73	30,85 ± 3,85	-11,81	<0,01*
<b>LPDV</b>	3,47 ± 0,89	2,53 ± 0,53	3,09	0,01*
<b>VTC</b>	11,39 ± 2,59	10,16 ± 2,85	1,13	0,27

In Table 1 it can be seen that the LPS task was performed in a slightly lower by the time you read the Group, while the task VTC was held for a time slightly lower for Group Fitness. Regarding tasks C10M and LCLC, the Group held you read the time in a significantly lower that the Group Fitness, which made the task of LPDV at a time significantly lower than Group you read.

In three of the five tasks performed the Group you read the better results, and in two of them the difference was statistically significant. For Group Physical Fitness showed better results in two of the five tasks evaluated, while in one the difference was significant statistical point of view.

In Figure 1 can be seen the best results submitted by the Group of tasks you read the C10M, LCLC (significant) and LPS (discrete) and the best results submitted by the Group of Physical Conditioning in tasks LPDV (significant) and VTC (discrete).

As proposed by the study evaluated the TR and TF are lessons CF, through the test of GDLAM, and it was found that the group that performs the TR obtained better results, having stood out to CF in three of the five tests (LPS, C10M\* and \*LCLC) noting that the two highlighted were statistically significantly better. Breaking paradigms that weight training can train others of functional capacity as the speed (C10M), strength (LPS), agility and balance (LCLC) Proving Santarém studies by [25], which identifies the training weights as a potential tool for improving the physical fitness of the elderly, making it more physically prepared for their activities of daily living (ADLs).

According to Gregg [12] and Nieman [23], active seniors as Spirduso classification [27], -exercising, get better results in their daily activities and testing of LPS, C10M and LCLC, due to the strength and balance of the extremities lower body, reducing the occurrence of falls and fractures, giving the practitioner double benefit, which would be an increase in bone mineral density and reducing the incidence of falls.

Having highlighted the line of authors who defend the practice of TR, such as maintenance of lean body mass, increased bone mineral density, control of diseases such as hypertension, stroke, obesity, diabetes, etc, muscle strengthening seeking life extension and reduction problems and obstacles imposed health and quality of life in excellent condition.

Thus, as a contribution to the study of the elderly and that first practice of the TR is paramount if not essential to the life of the elderly, since the decline of muscle mass is inherent, leading to sarcopenia, which may also be accompanied by the decline bone mineral density leading to osteopenia, two factors that can be avoided with the practice of Resistance Training [20], always remembering that having a professional monitoring of an area and able to serve you, second are the changes in sedentary older for a more active life, as improvements in QOL. Can and must be used resistance training as the main part in a training program for health.

The fitness classes, can not be ruled out, they obtained significant results, two tests and five one significantly (VTC and LPDV\*) however it should be as a way to search for improvements of the results achieved, exercises with weights or those who support the body's own weight are more efficient for modeling bone [6,15,16]. Can increase its intensity are through methods, weights, intervals or repetitions, get more leverage exercises that require more forms of exchanges of energy systems can work well with all of the fibers, the type I and type II.

Another highlight is the importance of physical education professional in this process, considering all possible risk factors and all the training variables, for best results and the safety of exercise participants, be they athletes or the elderly.

Another factor in the approach of the study was the contribution that the projects involved in the search for "Physical Fitness, Health and Strength" and "Polo Sport SEDUC / NEL" that promote health, well being, quality of life for the elderly participants of the same, and greater participation of university students in developing research projects and contributing to the implementation of studies, and the importance of creating more public policies that involve and encourage social projects with the same order of addition to generating health generate knowledge.

Finally we hope that the work will serve as a basis for such future studies mainly scientific production in the course of Physical Education UEPA or any area of scientific knowledge.

#### 4. CONCLUSION

This study aimed to compare the functional autonomy among elderly practitioners of TR and TF practitioners. We observed a significant difference in runtime between the groups. The biggest difference occurred in tests with more complexity, which needed attention and coordination. Comparing such findings of this study with other studies cited in this work we also used the elderly population as the focus of research, and in all studies the group practicing resistance exercise, obtained better performance on the test battery, there is strong evidence that resistance exercise prescribed by trained professionals is essential to maintaining functional independence in the elderly.

We recommend that further studies involving physical and functional autonomy for the elderly using exercise intensity and volume controlled by the researchers for a few weeks, trying to find out if there is a training method that is more valid and better outcomes for older people to achieve their functional autonomy.

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### **RESISTANCE TRAINING AND FITNESS CLASSES IN THE ELDERLY: A COMPARATIVE ANALYSIS THROUGH THE TEST GROUP OF LATIN AMERICAN DEVELOPMENT FOR MATURITY (LADM).**

#### **ABSTRACT**

The Resistance Training (RT) and classes Physical Fitness (CF) spaced, are the most applied to the elderly population due to its easy handling and control of variable factors relevant to the training; From this information, the concept worked TR and CF classes held at intervals, applied projects "Physical Fitness, Health and Strength" and "Polo Sport SEDUC / NEL" and a sample of the research within the elderly age 50 cut to 70 years, with the objective main analyze and compare the physical capabilities and autonomy of older people who do resistance training in the Laboratory of Health and resistance exercises (LERES) and seniors participating in the project Polo Sport SEDUC / NEL, the fitness classes at intervals, using as benchmark groups, the test group of Latin American Development to Maturity (LADM); specific objectives are to scan as a physical training influence on the performance of individual elderly in their daily tasks; analyze how resistance training and functional influence the functional capabilities of strength. Statistical data of the research were presented in tables and graphs and statistical analysis was performed using the Statistical Package SPSS 18.0 where it adopted the descriptive statistics (mean and standard deviation) for sample characterization, and inferential statistics through the Student t test for comparing the means of the variables between the different sample groups; Having highlighted the line of authors who defend the practice of TR, such as maintenance of lean body mass, increased bone mineral density, control of diseases such as hypertension, stroke, obesity, diabetes, etc., muscle strengthening seeking life extension and reduction of problems and obstacles imposed health and quality of life in excellent condition.

**KEYWORDS:** Resistance Training, Fitness; Elderly; LADM.

### **FORMATION DE LA RÉSISTANCE ET DES COURS DE FITNESS CHEZ LES PERSONNES ÂGÉES: UNE ANALYSE COMPARATIVE À TRAVERS LE GROUPE TEST DE L'AMÉRIQUE LATINE DEVELOPPEMENT DE MATURITÉ (GTLDM).**

#### **RÉSUMÉ**

La formation de résistance ( RT ) et cours de conditionnement physique ( CF ) espacées, sont les plus appliqués à la population des personnes âgées en raison de sa manipulation et le contrôle des facteurs variables pertinentes à la formation facile ; partir de cette information , le concept a travaillé TR et les classes FC tenues à intervalles , appliqué projets " condition physique , la santé et la force " et "Polo Sport SEDUC / NEL " et un échantillon de la recherche au sein de l' âge des personnes âgées de 50 coupe à 70 ans , avec l'objectif principal d'analyser et de comparer les capacités physiques et l'autonomie des personnes âgées qui font la formation de résistance dans le Laboratoire d'exercices de la santé et de la résistance ( que vous lisez ) et les personnes âgées qui participent au projet Polo Sport SEDUC / NEL , les cours de conditionnement physique à des intervalles , en utilisant comme groupes de référence , le groupe de test de développement latino-américain à l'échéance ( GDLAM ) ; objectifs spécifiques consistent à analyser comme une influence de l'entraînement physique sur la performance de l'individu personnes âgées dans leurs tâches quotidiennes , d'analyser comment la formation de résistance et fonctionnel influencer les capacités fonctionnelles de force. Données statistiques de la recherche ont été présentés sous forme de tableaux et de graphiques et de l'analyse statistique a été réalisée en utilisant le logiciel de statistiques SPSS 18.0 où elle a adopté les statistiques descriptives ( moyenne et écart type ) pour la caractérisation de l'échantillon et les statistiques inférentielles à travers le test t de Student pour comparer les moyennes des variables entre les différents groupes de l'échantillon ; Après avoir mis en évidence la ligne d'auteurs qui défendent la pratique de la TR, comme le maintien de la masse maigre , augmentation de la densité minérale osseuse , le contrôle des maladies telles que l'hypertension , accident vasculaire cérébral , l'obésité, diabète, etc , renforcement musculaire cherchant prolongation de la vie et la réduction des problèmes et des obstacles imposés santé et la qualité de vie en excellent état.

**MOTS-CLÉS:** formation de résistance; de remise en forme; Elderly; GTLDM.

### **EL ENTRENAMIENTO DE RESISTENCIA Y CLASES DE GIMNASIA EN LAS PERSONAS MAYORES: UN ANÁLISIS COMPARATIVO A TRAVÉS DEL GRUPO TEST DE AMÉRICA LATINA DESARROLLO DE VENCIMIENTO (PDALV).**

#### **RESUMEN**

El entrenamiento de resistencia ( RT ) y las clases de aptitud física ( CF ) espaciados, son los más aplicados a la población de edad avanzada , debido a su facilidad de manejo y control de los factores variables relevantes para la formación; partir de esta información , el concepto trabajado TR y clases de CF celebradas a intervalos , aplicar proyectos " aptitud física , la salud y la fuerza " y " Polo Sport SEDUC / NEL " y una muestra de la investigación dentro de la edad avanzada 50 corte a 70 años , con el objetivo principal analizar y comparar las capacidades físicas y la autonomía de las personas mayores que hacen entrenamiento de resistencia en el Laboratorio de Salud y ejercicios de resistencia ( leer ) y adultos mayores que participan en el proyecto Polo Sport SEDUC / NEL , las clases de acondicionamiento físico en intervalos , utilizando como grupos de referencia , el grupo de pruebas de desarrollo de América Latina al vencimiento (PDALV) ; objetivos específicos son para escanear como una influencia entrenamiento físico sobre el rendimiento de anciano en sus tareas diarias , analizar cómo el entrenamiento de resistencia y funcional influir en las capacidades funcionales de la fuerza . Datos estadísticos de la investigación fueron presentados en tablas y gráficos y el análisis estadístico se realizó mediante el paquete estadístico SPSS 18.0, donde se adoptó la estadística descriptiva ( media y desviación estándar ) para la caracterización de la muestra , y estadística inferencial mediante la prueba t de Student para comparando las medias de las variables entre los diferentes grupos de la muestra ; Habiendo destacado la línea de autores que defienden la práctica de la TR , como el mantenimiento de la masa corporal magra, aumento de la densidad mineral ósea , el control de enfermedades como la hipertensión , los accidentes cerebrovasculares , la obesidad , diabetes, etc , para fortalecer los músculos que buscan la extensión de vida y la reducción de los problemas y obstáculos que impone la salud y calidad de vida en excelentes condiciones.

**PALABRAS CLAVE :** entrenamiento de resistencia , Fitness , ancianos ; PDALV.

**O TREINAMENTO RESISTIDO E AULAS DE CONDICIONAMENTO FÍSICO EM IDOSOS: UMA ANÁLISE COMPARATIVA ATRAVÉS DO TESTE DO GRUPO DE DESENVOLVIMENTO LATINO-AMERICANO PARA A MATURIDADE (GDLAM).****RESUMO**

O Treinamento Resistido (TR) e aulas de Condicionamento Físico (CF) intervaladas, são as formas mais aplicadas ao público idoso, devido a sua fácil manipulação de variáveis e controle dos fatores relevantes ao treinamento; A partir dessas informações, trabalhou-se o conceito do TR e as aulas de CF realizadas de forma intervalada, aplicadas em projetos “Aptidão Física, Força e Saúde” e “Polo Esportivo SEDUC/NEL”, tendo como amostra da pesquisa idosos dentro do corte etário de 50 à 70 anos, com objetivo principal analisar e comparar as capacidades físicas e autonomia dos idosos que praticam o treinamento resistido no Laboratório de Exercícios Resistidos e Saúde (LERES) e os idosos que participam do projeto Polo Esportivo SEDUC/NEL, nas aulas de condicionamento físico de forma intervalada, utilizando como parâmetro de comparação dos grupos, o teste do Grupo de Desenvolvimento Latino-Americano para a Maturidade (GDLAM); os objetivos específicos são: verificar como um treinamento físico influencia no rendimento do indivíduo idoso em suas tarefas diárias; Analisar como os treinamentos resistido e funcional influenciam nas capacidades funcionais de força. Os dados estatísticos da pesquisa foram apresentados através de tabelas e gráficos e o tratamento estatístico foi realizado através do Pacote Estatístico SPSS 18.0 onde se adotou a estatística descritiva (média e desvio padrão) para caracterização da amostra, e a estatística inferencial através do teste t de Student para comparação entre as médias das variáveis estudadas entre os diferentes grupos amostrais; Tendo em destaque a linha dos autores que defendem a prática do TR, como manutenção da massa corporal magra, aumento da densidade mineral óssea, controle de doenças como hipertensão, AVC, obesidade, diabetes, etc, fortalecimento muscular buscando o prolongamento da vida e a redução de problemas e obstáculos impostos a saúde e a qualidade de vida em excelente estado.

**PALAVRAS CHAVE:** Treinamento Resistido; Condicionamento Físico; Idoso; GDLAM.