

# EVALUATION OF A PHYSICAL ACTIVITY PROGRAM DURING THE PERIOD OF 8 MONTHS FOR THOSE ABOVE 60 YEARS THROUGH THE PROTOCOL GDLAM

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## ABSTRACT

**Introduction:** This study aimed to evaluate the benefits that a program of physical activity is able to bring to the functional autonomy in the aged, through the protocol of the Grupo de Desenvolvimento Latino-americano para a Maturidade (GDLAM Protocol), carried out during eight months. **Materials and Methods:** There were 17 aged women (66±3 years) who did not practice physical activity for at least four months. The subjects participated in a program of physical activity (aerobic activity, resistance and flexibility) for eight months. The functional autonomy was evaluated through the GDLAM protocol, composed of the following tests: walk 10m (W10M), lift the sitting position (LSP), raising the ventral decubitus position (RVDP), getting out of chair and move it by home (CLMH), and take the shirt dress (DTS), general index (GI). We compared three stages: pre-exercise, four months after the start and eight months after the start. **Results:** Using an ANOVA for repeated measures followed by *post-hoc* LSD, significant differences ( $p<0.05$ ) in tests of C10M, LCLC and IG pre-test for eight months were found. **Discussion:** After eight months of physical activity, the aged had an improvement in functional autonomy, which facilitated the implementation of activities of daily life.

## KEYWORDS

Personal Autonomy; Aged; Motor Activity.

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## AVALIAÇÃO DE UM PROGRAMA DE ATIVIDADE FÍSICA DURANTE O PERÍODO DE 8 MESES PARA INDIVÍDUOS ACIMA DE 60 ANOS POR MEIO DO PROTOCOLO GDLAM

### RESUMO

**Introdução:** O presente estudo teve como objetivo avaliar os benefícios que um programa de atividade física pode trazer para a autonomia funcional no idoso, por meio do protocolo do Grupo de Desenvolvimento Latino-americano para a Maturidade (Protocolo GDLAM), realizado no decorrer de oito meses. **Materiais e Métodos:** Participaram do estudo 17 idosas ( $66 \pm 3$  anos) que não praticavam atividade física há pelo menos quatro meses. Elas participaram de um programa de atividade física (atividades aeróbicas, de resistência e flexibilidade) durante oito meses. Foi avaliada a autonomia funcional por meio do Protocolo GDLAM, composto dos seguintes testes: caminhar 10 m (C10m); levantar da posição sentada (LPS); levantar da posição decúbito ventral (LPDV); levantar-se da cadeira e locomover-se pela casa (LCLC); vestir e tirar a camisa (VTC); índice geral (IG). Foram comparados três momentos: pré-exercício, quatro meses após o início e oito meses após o início. **Resultados:** Por meio de uma ANOVA para medidas repetidas seguida do *post hoc* de LSD, foram encontradas diferenças significativas ( $p < 0,05$ ) nos testes de C10m, LCLC e IG do pré-teste para oito meses. **Discussão:** Após oito meses de prática de atividade física, os idosos obtiveram uma melhora na autonomia funcional, o que facilitou a realização das atividades de vida diárias.

### PALAVRAS-CHAVE

Autonomia Pessoal; Idosos; Atividade Motora.

## EVALUACIÓN DE UN PROGRAMA DE ACTIVIDAD FÍSICA DURANTE EL PERÍODO DE 8 MESES PARA LAS PERSONAS DE MÁS DE 60 AÑOS POR EL PROTOCOLO GDLAM

### RESUMEN

**Introducción:** Este estudio tiene como objetivo evaluar los beneficios que un programa de actividad física es capaz de llevar a la autonomía funcional en las personas de edad avanzada, a través del protocolo del Grupo de Desarrollo Latino-americano para la Maturidad (Protocolo GDLAM), realizado durante ocho meses. **Materiales y Métodos:** El estudio incluyó 17 mayores ( $66 \pm 3$  años) sin la práctica de actividad física por lo menos cuatro meses. Los sujetos participaron en un programa de actividad física (actividad aeróbica, resistencia y flexibilidad) durante ocho meses. Se evaluó la autonomía funcional a través del protocolo de GDLAM, integrado por las siguientes pruebas: a pie de 10m (C10M), levantar de la posición sentada (LPS); el aumento de la posición de decúbito ventral (LPDV); salir de la silla y pasar por hogar (LCLC); vestir y tirar la camisa (VTC); índice general (IG). Se compararon tres etapas: pre-ejercicio, cuatro meses después del inicio y ocho meses después de la salida. **Resultados:** Por el uso de una ANOVA para medidas repetidas seguida de *post hoc* LSD, fueron encontradas diferencias significativas ( $p < 0,05$ ) en las pruebas de C10M, IG LCLC y previo a la prueba durante ocho meses. **Discusión:** Después de ocho meses de actividad física, las personas de edad avanzada obtuvieron una mejora en la autonomía funcional, o que facilitó la ejecución de las actividades de la vida cotidiana.

### PALABRAS CLAVE

Autonomía Personal; Ancianos; Actividad Motora.

### INTRODUCTION

According to data of the World Health Organization (WHO), in 2025, Brazil will occupy the sixth place in the world rank of the aged population, when 15% of its population, i.e., over 32 million people will have 60 years old or more<sup>1</sup>. For Pereira *et al.*<sup>2</sup>, one of the elements that determine the life expectation with quality is the autonomy, defined as the capacity that an individual has of making daily life activities (DLA), without partial or complete help of third people. Therefore, autonomy can be one of the main losses of aging<sup>3</sup>.

The preservation of the thin mass and the prevention of fat gains are important measures for the maintenance

of the muscular power in aged, which can help to avoid falls and improve the functional autonomy<sup>4,5,6</sup>. With age, several physiological processes occur in the organism, as cardiovascular, pulmonary and muscular-skeletal alterations<sup>7</sup>. In this context, muscular-skeletal alterations are pointed out, since the commitment of the motor function affects directly the quality of life of the aged, decreasing, therefore, their abilities to do simple tasks. The regular physical exercise is an efficient manner to maintain the functional autonomy of aged subjects<sup>8</sup>. Posner *et al.*<sup>3</sup> and Carvalho *et al.*<sup>9</sup> affirm that the against resistance training increases the performance of ADL. As hydrogymnastic benefits, improvements in the aerobic conditioning, mus-

cular strength, flexibility and body composition<sup>10,11,12</sup> are detached.

Therefore, the present study aimed at investigating the benefits that a physical activity program is able of bringing to the functional autonomy in the aged, by the protocol of Grupo de Desenvolvimento Latino-americano para a Maturidade (GDLAM protocol), carried out in eight months.

## MATERIALS AND METHODS

### Sample

The sample was composed of 17 elderly women (66±3 years old), apparently healthy and sedentary for at least four months and who participated of a physical activity program established in the unit of Serviço Social da Indústria/Serviço Nacional de Aprendizagem Industrial (SESI/SENAI) of Itaperuna (RJ). In this research, the inclusion criteria adopted were: medical discharge, ability to the physical exercise practice, ages equal or superior to 60 years old and to be in the beginning of the Third-Age Program of Sesi. The following were considered as exclusion criteria: lack of physical conditions or any pathology, especially if related to some muscular-skeletal limitation and if it could limit the realization of activities or compromise the test results. All the participants were informed about the training risks and signed an Informed Consent Form, which contained the objectives and procedures of the study to take part in this research. The experimental procedures were done in conformity with the ethical rules foreseen in resolution n. 196, of October 10, 1996, from the National Health Counsel. The study had its research project submitted and approved by the Ethics and Research Committee Involving Human Beings of Fundação Universitária de Itaperuna (Funita).

### Procedures

The program was composed by activities that gave priority to the physical valences necessary for the ADL. With a frequency of three times per week and 50 minutes duration, subjects were submitted to hydrogymnastic classes, using equipments (dumbbells and bats) to increase water resistance; stretching classes, using elastics and bats; aerobics, performed without material resources, because they consisted in an alternate walking in the court and in the green field; and against resistance exercises, carried out with its own body segment. All the activities always started with ten minutes of warm-up and alternates during the month.

The survey was carried out from the tests that evaluated the functional autonomy. For the group evaluation, five tests that compounded the GDLAM protocol were

adopted: to walk 10m (W10m)<sup>13</sup>; to raise from the seated position (RSP)<sup>14,15</sup>; to raise from the ventral decubitus position (RVDP)<sup>16</sup>; to raise from the chair and walk through the house (RCWH)<sup>17</sup>; and to dress and take off the shirt test (DTS)<sup>18</sup>. All these tests were used for the calculus of the general index of GDLAM (GI)<sup>19</sup>. During the tests realization, subjects should do two attempts for each of them, recording the fastest execution (smaller time). The following were used as evaluation instruments in the tests: worksheet for data collection, chronometer (Casio); a chair without support for the arms with a seat on 50cm of the floor; five cones; small mattress (Ortobom); and a mesh shirt.

Tests were carried out in the morning, in the same time and place in which the physical activities were performed. The three data collection, by the GDLAM protocol, was done each four months, one in the beginning of the program and the two others, subsequent to the first.

### Statistical treatment

The statistical treatment was performed in the program Statistical Package for the Social Sciences (SPSS), version 17.0. The characteristics of data are presented by mean and standard deviation. The Shapiro-Wilk test was used to verify the normality of the sample. The statistical inference was performed by ANOVA, for repeated measures, to analyze the possible differences between the three different moments, and with *post hoc* of LSD, to identify them. The study admitted the value of  $p < 0.05$  for the statistical significance.

## RESULTS

Table 1 shows the values of each test in each one of the three moments and their differences. When analyzing it, a significant improvement in the execution time of the W10m, RCWH tests and in the GI of the first test related to the third, eight months after the training. This finding demonstrated the training efficacy for the variable "functional autonomy of the ADL" in eight months of the program, however, from the first to the second test (four months after the beginning), no significant differences were found in none of the compared parameters, as well as the second related to the third moment.

## DISCUSSION

Although literature discloses a series of studies related to physical exercises benefits, few papers investigated the relation between varied physical activities practice and the functional autonomy in aged with more than 60 years old. According to the results presented in this research, the physical activity practice and the exercises guided

**Table 1 - Mean of the time of the autonomy tests of GDLAM**

Tests	Pre	4 months	8 months
W10m	6.90±0.89	6.59±0.81	6.35±0.73*
RSP	8.56±1.29	8.53±1.52	7.68±1.21
RVDP	4.14±0.54	3.47±0.44	3.23±0.32
RCWH	45.89±5.52	43.52±6.01	42.37±5.76*
DTS	10.30±1.22	10.19±1.65	10.17±1.92
<b>GI</b>	<b>14.61±1.56</b>	<b>13.42±1.69</b>	<b>12.84±1.41*</b>

W10m: to walk 10 m; RSP: to raise from the seated position; RVDP: to raise from the ventral decubitus position; RCWH: to raise from the chair and walk through the house; DTS: to dress and take off the shirt; GI: general index; mean checked in seconds.

\* $p < 0.05$ , pre versus 8 months.

regularly exert a fundamental role in aged lives, improving their autonomy for the ADL realization and warranting the personal independency. In the present investigation, it was verified that four weeks of physical activities were not sufficient to change any of the performed tests. Nevertheless, with eight weeks, the W10m, RCWH tests and the GI were significantly different. The most important was observed by the GI, which indicated a significant improvement of the beginning of the training related to the final of eight weeks, modifying, positively, the functional autonomy of the aged.

In a similar study, Guimarães *et al.*<sup>20</sup> compared, by the GDLAM protocol, two aged groups of both sexes (male and female, in both groups), submitting a group to the practice of a physical activity program and maintaining the other group without exercises practice. The trained subjects had a classification considered good in the W10m, RVDP and DTS tests. Our results also presented improvements, but not exactly in the same tests, which can be justified by the time difference of intervention of the specificity of the accomplished activities. Using the same protocol of the present study, but with only four tests (W10m, RSP, RVDP and RCWH), Belloni *et al.*<sup>21</sup> compared the functional autonomy of two elderly women group: in one group, hydrogymnastic practitioners, and in the other, sedentary women. The RSP, RVDP and RCWH presented significant differences between the groups. It should be noted that the results of all the tests in which was necessary to stand up were significantly different, demonstrating that hydrogymnastic can be more useful for this type of movement. In our study, the tests results, in which significant differences were observed, were those that involved walks – possibly by the specificity of the training, because this activity was constantly used in the sessions.

With aging, there is a progressive loss in physical valences that an aged needs. However, this study demonstrated that sedentary aged, by a training program, reach an improvement in physical abilities, specifically

in walking, since the tests which obtained significant improvements (RCWH and W10m) are related to this activity. Mazzeo *et al.*<sup>22</sup> affirmed that the against resistance training offers benefits to the quality of life of aged, improving their capacity to walk, the velocity, the balance, the ability to raise from a chair and step up the stairs. Fiataroni *et al.*<sup>23</sup> carried out a study with aged from 72 to 98 years old, with against resistance training and nutritional supplementation, and observed an increase in the velocity of walking (11%), potency to step up the stairs (28%) and increase in the spontaneous physical activity (34%), showing improvements in the ADL.

Generally, it could be noted an improvement in the aged autonomy that took part in this study by the GI. Each subject must look for the type of physical activity that better fits his needs, besides searching for a pleasure activity, so that there is a bigger adherence. It is important to know that activities that have different physical valences can be more complete to attend everybody's needs; the combination among them can be an excellent option, as in the current study's case.

The decline of the physical capacities and the physiological changes due to aging are aspects that should be taking into consideration in the moment of the preparation of exercises programs for the aged. In virtue of this, the elderly participation in regular physical activity programs influences directly in the aging process, improving the organic functions and warranting better personal independency. From a well-structured regular physical activity program, the aged is able to retard the aging effects and, with this, develop the necessary physical valences for an independent and satisfactory daily life, aiming always at the progress of its autonomy. Thus, it is inferred that a regular physical exercise program, in eight months, is sufficient to obtain a significant improvement in the aged autonomy.

## REFERENCES

1. Instituto Brasileiro de Geografia e Estatística (IBGE) [Internet]. Política do Idoso no Brasil. [citado em 2009 ago 3]. Disponível em: [http://www.ibge.gov.br/ibgeteen/datas/idoso/politica\\_do\\_idoso\\_no\\_brasil.html](http://www.ibge.gov.br/ibgeteen/datas/idoso/politica_do_idoso_no_brasil.html).
2. Pereira FF, Monteiro N, Portal MND, Vale RGS, Dantas EHM. Relação entre o Nível Sérico Basal de GH e de IGF-1 e a Autonomia e o Estado de Condicionamento Físico da Idosa Ativa. *Fit Perf J.* 2005;4: 352-7.
3. Posner JD, McCully KK, Landsberg LA, Sands LP, Tycenski P, Holfmann MT *et al.* Physical determinants of independence in mature women. *Arch Phys Med Rehabil.* 1995;76:373-80.
4. Cress ME, Meyer M. Maximal voluntary and functional performance levels needed for independence in adults aged 65 to 97 years. *Phys Ther.* 2003;83:37-48.
5. DeVito CA, Morgan RO, Duque M, Abdel-Moty E, Virnig BA. Physical performance effects of low-intensity exercise among clinically defined high-risk elders. *Gerontology.* 2003;49:146-54.

6. Anton MM, Spirduso WW, Tanaka H. Age-related declines in anaerobic muscular performance: weightlifting and powerlifting. *Med Sci Sports Exerc.* 2004;36:143-7.
7. MCadrlle WD, Katch FI, Katch VL. *Fisiologia do exercício, energia, nutrição e desempenho humano.* 5 ed. Rio de Janeiro: Guanabara Koogan; 2003.
8. Hruda KV, Hicks AL, McCartney N. Training for muscle power in older adults: effects on functional abilities. *Can J Appl Physiol.* 2003;28:178-89.
9. Carvalho J, Oliveira J, Magalhães J, Ascensão A, Mota J, Soares JMC. Força muscular em idosos II – Efeito de um programa complementar de treino na força muscular de idosos de ambos os sexo. *Rev Port Cienc Des.* 2004;4:58-65.
10. Spirduso W. *Physical dimensions of aging.* Champaign: Human Kinetics; 1995.
11. Marques MB, Araújo FNP. *Hidroginástica exercícios comentados: cinesiologia aplicada à hidroginástica.* Rio de Janeiro: Ney Pereira, 1999.
12. Paula AP, Pessoa DMF. Comparação da aptidão cardiorrespiratória e o índice de massa corporal entre idosos praticantes de hidroginástica e de dança coreografada. In: XXV Simpósio internacional de Ciências do Esporte. Anais. São Paulo: [s.n.], 2000.
13. Sipilä S, Multanen J, Kallinen M, Era P, Suominen H. Effects of strength and endurance training on isometric muscle strength and walking speed in elderly women. *Acta Physiol Scand.* 1996;156:457-64.
14. Guralnik JM, Ferrucci L, Simonsick EM, Salive ME, Wallace RB. Lower-extremity function in persons over de age of 70 years as a predictor of subsequent disability. *N Engl J Med.* 1995;332:556-61.
15. Guralnik JM, Ferrucci L, Pieper CF, Leveille SG, Markides KS, Ostir GV et al. Lower extremity function and subsequent disability consistency across studies, predictive models and value of gait speed alone compared with the short physical performance battery. *J Gerontol A Biol Sci Med Sci.* 2000;55:M221-31.
16. Alexander NB, Ulbrich J, Raheja A, Channer D. Rising from the floors in older adults. *J Am Geriatr Soc.* 1997;45:564-9.
17. Andreotti RA, Okuma SS. Validação de uma Bateria de Testes de Atividade da vida diária para idosos fisicamente independentes. *Rev Paul Educ Fis.* 1999;13:46-66.
18. Dantas EHM, Vale RGS. Protocolo GDLAM de avaliação da autonomia funcional. *Fit Perf J.* 2004;3:175-80.
19. Valle RGS. Avaliação da autonomia funcional do idoso. *Fit Perf J.* 2005;4:4.
20. Guimarães AC, Rocha CAQC, Gomes ALM, Cader AS, Dantas EHM. Efeitos de um programa de atividade física sobre o nível de autonomia de idosos participantes do Programa de Saúde da Família. 2008;7:5-9.
21. Belloni D, Albuquerque AC, Rodrigues TO, Mazini Filho ML, Silva VF. Estudo comparativo entre a autonomia funcional de mulheres idosas praticantes e não praticantes de hidroginástica. *Rev Educ Fis.* 2008;140:20-6.
22. Mazzeo RS, Cavanagh P, Evans WJ, Fiatores MA, Hagberg J, McAuley E et al. Exercício e atividade física para pessoas idosas. *Rev Bras Ativ Fis Saúde.* 1998;3:48-68.
23. Fiatarone MA, O'Neill EF, Ryan ND, Clements KM, Solares GR, Nelson ME et al. Exercise training and nutritional Supplementation for physical frailty in very elderly people. *N Engl J Med.* 1994;330:1769-75.

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