# 09 - THE EFFECT OF RESISTANCE EXERCISE ON QUALITY OF LIFE AND SYMPTOMS OF DEPRESSION IN THE ELDERLY.

ELTON JOSÉ DA SILVA AGUIAR
REJANE WALESSA PEQUENO RODRIGUES
DENISE DIAS DA SILVA
ANA LORENA LIMA FERREIRA
EVITOM CORRÊA DE SOUSA
Universidade do Estado do Pará, Belém, Pará, Brasil
LERES – Laboratório de Exercício Resistido e Saúde
GEERES – Grupo de Estudo em Exercício Resistido e Saúde
elton_jsa@hotmail.com

## INTRODUCTION

In general, aging is defined as a loss process, analyzing it from cellular degeneration, increased vulnerability to disease and reduced muscle mass and bone mass (ZUMERCHICK, 1997).

Aging is a natural process that characterizes a stage of life, physical changes occur at this stage, psychological and social, affecting every human being individualized (Zimerman, 2000).

Weineck (1992, p. 398) described aging as a result of biological, psychological and social changes that occur after adulthood, with a "progressive reduction of the capacity for adaptation and psychophysical performance of the individual." As records of Sheik (2003), the aging process leads to a decreased quality of life that is directly related to the degree of satisfaction that the individual has of himself. According to the author, this dissatisfaction may lead the elderly to psychological disorders, depression and anxiety.

The aging population, which according to IBGE (BRAZIL, 2001) estimated that in the next 20 years the elderly population will reach and even surpass the figure of 30 million people, representing approximately 13% of the population. This growth is associated with high prevalence of chronic degenerative diseases, among them those that impair the functioning of the central nervous system, such as neuropsychiatric disorders, particularly depression that is a "disease" as diagnosed by a psychiatrist from the presence of certain symptoms that manifest a certain duration, frequency and intensity, such as depressed mood (or manic), and the manifestation of certain phenomena such as changes in sleep, appetite changes, psychomotor agitation or retardation, fatigue, excessive guilt, thoughts of death, suicidal ideation , attempted suicide, among others, define depression (RODRIGUES, 2000).

Small changes in habits can help prevent and reduce the appearance of this disease in general studies, such as (Kritz-SILVESTIEN et al. 2000; BLAY et al., 2007) suggest a positive relationship between the practice of physical activity and changes in depressive symptoms, suggesting a protective effect of physical activity in depression. Soon some interventions, such as the change of lifestyle, leaving the lifestyle, the practice of regular exercise, can degrade such psychological changes, so with the aging population, such interventions make a major role in the search for healthy aging.

For these reasons, we highlight the physical exercise as a major ally in the pursuit of health and quality of life that far beyond the physical benefits, it also provides psychological and social benefits, these are critical to human life, especially for life the elderly.

Currently recognized as the most important for the elderly, resistance exercises gain importance in this context (Hurley et al., 2000), these are exercises performed against resistance gradually controlled, that usually imposed by resistance weights, also popularly called the weight ( Santos, 1998).

Resistance exercises include not only the efficiency of health-promoting effects of skeletal muscle and the high degree of overall security, but also by their stimuli to cardiovascular health and psychological (Hurley et al., 2000).

Besides the aesthetic and physical benefits, exercise with weights stimulates the interpersonal relationship, living with other people, and help accomplish tasks that previously had the same difficulties, increasing the degree of satisfaction that the individual has of himself, helping control symptoms of depression (Santos 1999).

There is no doubt the importance of exercise in the life of any individual, as an element capable of contributing significantly to the physical well being as well as mental (GARRET; KIRKENDAL cited ROSE et al., 2001).

The effect of exercise on depression has been thoroughly investigated. People who have a framework for media or mild depression after doing an aerobic exercise program over a period of three weeks, can reduce these symptoms (Becker Junior, 2000). But very little is said of resistive exercise. Hence we see the need for more research on this subject.

Research like that of North et al. cited in Becker Junior (2000) conducted a meta-analysis of eighty volunteers, found that exercise can reduce depression, both in normal subjects and in clinical populations, thus it is observed that even in individuals clinically diagnosed as depressed exercise physicist has proven effective in reducing symptoms related to depression.

Plant cited in Becker Junior (2000) suggest explanatory hypotheses for emotional gains of exercisers, which are divided into biological and psychological. At biological hypotheses can be assigned: the increased release of endorphins, increased body temperature, increased adrenal activity (catecholamines), shares of Norepinifrina, serotonin and dopamine, increase blood flow and oxygenation and increased cardiovascular fitness, ace psychological hypotheses can be assigned: distraction, self-efficacy, social support and physiological regulation of the activation state of consciousness.

A study conducted by Lopes (2001) observed the effects of eight weeks of aerobic exercise on serotonin levels and depression in women between 50 and 72 years. Was applied in this study, the Beck Depression Inventory and laboratory tests were performed to dosage levels of serotonin. The results indicated a reduction in the percentage of fat and plasma levels of serotonin, suggesting that this relationship between exercise and fat mobilization provides the participants an improvement in mood states.

Once the above suggests that resistance training is directly related to the improvement of the morphology and physiology of the body and also promotes increased release of endorphins, decreased levels of serotonin (Winett, Carpinelli, 2001) among others, the same way as aerobic exercise, so it is suggested then that this also provides a reduction of symptoms related to depression.

Thus the study in question comes as an alternative to study these gaps left by previous studies. Using as a problem,

"What are the effects of resistance exercise on symptoms of depression in the elderly, 60 to 80 project participants read through the Quality of Life / CEDF-UEPA this research aims at studying the effects of resistance exercise on symptoms of depression in elderly and to identify symptoms of depression and to evaluate the influence of resistance exercise acts significantly in symptoms of depression.

**MATERIALS AND METHODS**

This study was a trial was conducted with volunteers practicing resistance exercise and a control group of sedentary elderly volunteers belonging to the community surrounding the campus of you read / UEPA CEDF using a single-center for the experiment without funding.

For both the population used for this research was composed of about 70 elderly participants in Project Resistance Exercise and Quality of Life of which you read were chosen randomly by 15 volunteer participants over six months of this extension project that formed the Group experimental (EG) and 15 elderly sedentary chosen randomly in the community surrounding the campus of you read / CEDF-UEPA who formed a control group (CG).

The group was subjected to a resistance training program consisting of 6-8 exercises performed in two sets of eight to twelve repetitions, twice a week, Leg 45, Leg Horizontal, Traction, Land Survey, Survey Power, bench press, bench press Sitting, Standing Calf, Machine Development, Remada Unilateral, abdomen above and below, the exercises are practiced by this group of extension, which are chosen according to the specifics of the student, always respecting the protocol described by little.

The data were collected with the use of two questionnaires, the SF-36 questionnaire is a Portuguese version of the Medical Outcone Study Short Form-36 (SF-36) that evaluates the quality of life, and Yesavage Geriatric Scale ( 1983) which evaluates the level of depression in the elderly. These questionnaires were applied in the two groups belonging to the study, then left for the comparison of the results of GE with the GP in order to weigh the data and get a conclusion as to them.

The data were presented in tables and charts, and treated statistically using the SPSS 18.0 statistical package, which adopted the descriptive statistics of frequencies to present the data of the sample distribution for the different classifications of depression, but also for quantitative variables adopted by the presentation of the average and standard deviation. For the inferential statistics we used the Student t test for comparison between means of variables between the two groups, the distribution of major components to identify the main elements of quality of life in each group, and chi-square test for analyze the difference between the levels of classification of intra-depression group. To analyze the inference was adopted a significance level of $p \leqslant 0.05$.

**RESULTS**

Table 1 shows the characteristics of two groups, experimental and control for variables related to quality of life and its components and the level of depressed subjects.

Table 1 - Descriptive characteristics of the investigated groups (mean ± standard deviation) and comparative analysis between the groups (Student's t test).

| Variable | Control | experimental | T | *P* |
|---|---|---|---|---|
| **Vital Capacity** | 36,00 ± 28,30 | 84,33 ± 7,99 | -6,37 | <0,01* |
| **Limitations Physical Aspects** | 23,33 ± 34,68 | 80,00 ± 30,18 | -4,77 | <0,01* |
| **Pain** | 51,33 ± 25,03 | 74,67 ± 23,86 | -2,61 | 0,01* |
| **General Health** | 57,33 ± 17,92 | 78,67 ± 13,82 | -3,65 | <0,01* |
| **Vitality** | 60,67 ± 26,25 | 75,67 ± 16,78 | -1,87 | 0,07 |
| **Social Aspects** | 70,00 ± 24,46 | 86,67 ± 15,28 | -2,24 | 0,03* |
| **Limitations Emotional Aspects** | 22,21 ± 27,21 | 68,87 ± 34,44 | -4,12 | <0,01* |
| **Mental Health** | 69,87 ± 21,32 | 82,93 ± 16,93 | -1,86 | 0,07 |
| **Geriatric scale** | 9,40 ± 4,84 | 5,53 ± 2,56 | 2,74 | 0,01* |

Source: you read, 2011

Legend: T - index of variance, p - significance level ($\leqslant 0.05$)

In Table 1 we can observe that the control group is presented in a much more heterogeneous than the experimental group, which can be understood through the high standard deviation observed in the control group for the variables discussed in the table. This can be influenced by training, minimizing the differences between subjects who regularly participate in the training program in question.

Can still be seen in table 1 that all components of quality of life in the experimental group had an average rate higher than in the control group, while in the variable on the rate of depression this value was lower in the experimental group. From the statistical point of view, it was observed that the experimental group showed significantly higher levels to the control group for the variables of vital capacity, limitations on physical aspects of pain, general health, social aspects and limitations of emotional aspects. Regarding the level of depression was found significantly less in the subjects in the experimental group than in the control group subjects. The variables of vitality and mental health, although they are higher in subjects in the experimental group were not statistically significant.

Figure 1 shows the distribution of major components of quality of life in the control group. Here we can see that the main components of this variable for this group were the Social Aspects (51.23%), the Mental Health (14.73%), Vitality (10.14%) and General Health (9, 01%).

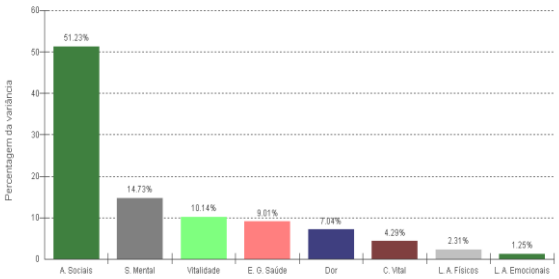

Chart 1 - Main components of quality of life in the control group.

Figure 2 shows the distribution of major components of quality of life in the experimental group. Here we can see that the main components of this variable for this group were the Social Aspects (56.02%), the vital capacity (14.10%) and Mental Health (11.44%).

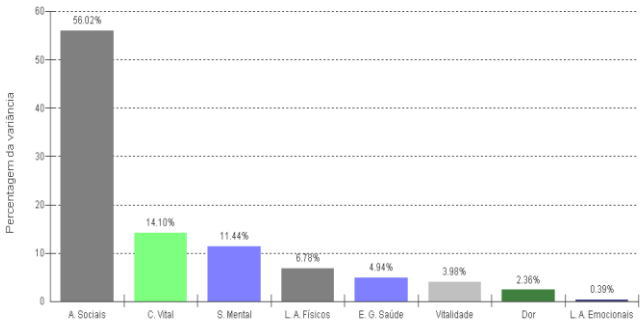


Figure 2 - Major components of quality of life in the experimental group.

In Table 2 we can see the percentage distribution of the classification of subjects of both groups, to varying levels of depression relative to the sample and the comparison of the number of subjects in different grades.

Table 2 - Classification of level of depression according to the scale of Yesavage in both groups and compared the levels of intra-group classification (chi-square).

| Group | classification | | | $x^2$ | *P* |
|---|---|---|---|---|---|
| | normal | average | severe | | |
| **Control** | 8 (53,3%) | 7 (46,7%) | --- | 0,08 | 0,80 |
| **Experimental** | 15(100,0%) | --- | --- | --- | --- |

Source: you read, 2011

Legend: X2 - index of variance, p - significance level ($\leqslant 0.05$)

In Table 2 note that the slight majority (without statistical significance) of the subjects had normal levels of depression compared with the number of subjects who had average levels of depression, whereas there was no case of severe depression in the control group. In the experimental group what we saw is that all sample subjects had normal levels of depression, with no cases of severe or mild depression.

In Figure 3 we can see that in the control group, the slight majority (53%) had normal levels of depression, while the experimental group was observed that all subjects were classified as normal for the level of depression.

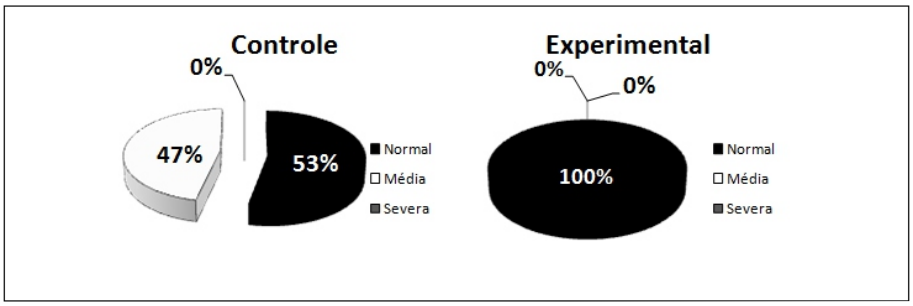


Figure 3 - Classification of groups in the level of depression.

**DISCUSSION**

Ratamess et al. (2009) points out in his research that the practice of ER brings benefits to physical and psychological health, improving levels of humor, social life, functional independence, and reduction of symptoms of depression such as low self esteem and insomnia which explains the effect protector of this exercise symptoms of depression, which corroborates the results found were you can see that a slight majority in the GC (53%) had normal levels of depression, and 47% had depression in the media while GE was observed that all subjects presented the ranking for the level of depression.

In summation with such benefits, the ER increases the basal metabolism, reduces the loss of muscle mass, reduces fat percentage, decrease back pain, reduces risk of falls and fractures, helps fight obesity among many other benefits of this practice, which combined psychological and social improvements already mentioned above, are closely linked to improved quality of life of the population studied (LOVELL et al., 2009). What may have contributed to the best results in terms of quality of life and levels of depression were found in EG compared to GC in this study.

**CONCLUSION**

With this research, it was found that elderly practitioners of ER, display higher levels of quality of life and fewer symptoms of depression compared to the GC, suggesting a protective effect of resistance exercise in improving the quality of life and reduction of symptoms related to depression.

It is concluded that the practice of resistance exercise appears to improve levels of depression, so common at this stage of life, as with advancing age, people are more likely to have that type of disease. In addition to improving the quality of life indices.

It is suggested that further studies with larger samples and longer observation are carried out to consolidate, scientifically, the results and conclusions found in this study.

**REFERÊNCIAS**

BLAY, S.; ANDREOLI, S.; FILLENBAUM, G.; GASTAL, F.L. Depression morbidity in later life: prevalence and correlates in a developing country. **Am Journal of Ger Phy**. v. 15, n. 9, pp. 790-799, 2007.

BRASIL, **INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA (IBGE).** Dados preliminares da Censo 2000. Rio de Janeiro: IBGE, 2001.

BECKER JR, B. **Manual de Psicologia do Esporte e Exercício.** Porto Alegre. Editora Nova Prova, 2000.

CHEIK, N. C.; REIS, I. T.; HEREDIA, R. A. G.; VENTURA, M. L.; TUFIK, S.; ANTUNES, H. K. M.; MELLO M. T. Efeitos do exercício físico e da atividade física na depressão e ansiedade em indivíduos idosos. **Rev Bras Ci e Mov**.,v.11, n.3, p.45-52, jul./set., 2003.

HURLEY, B.F.; ROTH, S.M.. Strength training in elderly effects on risk factors for age-related diseases. **Sports Med.** v. 30, p. 249-268, 2000.

KRTZ-SILVERSTEIN, D.: BARRETT-CONNOR, E.: CORBEAU, C. Cross-sectional and prospective study of exercise and depressed mood in the elderly- The Rancho Bernardo study. **Am Journal Epidem,** v.144, p.73-81, 2006.

LOPES KMDC. **Os efeitos crônicos do exercício físico aeróbio nos níveis de serotonina e depressão em mulheres com idade entre 50 e 72 anos** [Dissertação Mestrado]. Brasília: Universidade Católica de Brasília, 2001.

RATAMESS, N.A.; ALVAR, B.A.; EVERTOCH, T.K.; HOUSH, T.J. Posicionamento do Colégio Americano de Medicina do Esporte sobre Treinamento Resistido para adultos saudáveis. **Med Sci Sport Exerc.**, p.687-708, 2009.

RODRIGUES, M. J. S. F. O diagnóstico de depressão. **Psicol. USP.** v.11, n.1, p.155-187, 2000.

ROSA, G.; PEREIA, M. A. F.; SIMÂO, R.; PERDIGÂO, R.; SILVA, U. P. A. Treinamento de Força em Crianças e Adolescentes. **Rev Bai de Ed Física.** v.2, n.3, p.35-44, 2001.

SANTAREM, J. M. **Promoção da saúde do idoso**: A Importância da Atividade Física. Disponível em:<http://www.saudetotal.com.br/artigos/atividadefisica/idoso.asp.> Acesso em: 27 maio 2010.

_____.Qualidade dos exercícios resistidos. Disponível em: <http://www.saudetotal.com.br/artigos/atividadefisica/qualidade.asp>. Acesso em: 29 maio 2010.

WEINECK, JURGEN. **"Biologie du sport".** Paris: Vigot, p. 398-438, 1992.

WINETT, R.A.; CARPINELLI R.N. Benefícios potenciais do Treinamento Resistido relacionados à saúde. **Prev. Medice,** v.33, p. 503-513, 2001.

ZIMERMAN, G. I. Velhice: aspectos biopsicossociais. Porto Alegre: **Artmed,** 2000.

ZUMERCHIK, J. Aging and performace. **New York: Macmillan Library,** p.583-602,1997.

Autor: Elton José da Silva Aguiar,
Rua Liberato de Castro, Passagem Cristovão Colombo nº 41,
Guamá,
CEP: 66075 - 190,
Belém-Pará,
(91) 3259-1191, elton_jsa@hotmail.com

**THE EFFECT OF RESISTANCE EXERCISE ON QUALITY OF LIFE AND SYMPTOMS OF DEPRESSION IN THE ELDERLY.**

**SUMMARY**

Data indicate the global aging population. This phase of life is characterized as a process of cognitive and functional losses. This growth accompanied by a high rate of chronic degenerative diseases, among them those that affect the central nervous system, especially depression, which is a "disease" diagnosed from the symptoms that manifest a certain duration, frequency and intensity. Considered today as the most important for the elderly, resistance exercise (RE) wins a major role because of the high degree of security and its stimuli to cardiovascular health and psychological. In this context, this study aims to determine what the effects of ER in depressive symptoms and quality of life in older adults 60 to 80 years of Project ER and Quality of Life you read. Data were collected through questionnaires SF-36 and Yesavage Geriatric Scale (1983). This research was conducted at the read through, with a sample of 30 elderly volunteers of both sexes, which are divided into two groups: experimental group (EG) and Control Group (CG) of 15 elderly. We used descriptive statistics to present the frequency distribution data of different classifications of depression. For the inferential statistics we used the Student t test and chi-square test to analyze the difference between the levels of classification of intra-depression group. To analyze the inference was adopted a significance level of $p \leqslant 0.05$. It was observed that there was a statistically significant difference between groups, with advantage for GE, which had better quality of life index and no depression. It is concluded that the practice of ER, appears to favor the lower levels of depression and improve quality of life indices.

**KEY WORDS:** Elderly, Strength Training, Depressive Symptoms.

**L'EFFET DE L'EXERCICE DE MUSCULATION SUR LA QUALITÉ DE VIE ET DES SYMPTÔMES DE DÉPRESSION CHEZ LES PERSONNES ÂGÉES.**

**SOMMAIRE**

Les données indiquent que la population mondiale vieillit. Cette phase de la vie est caractérisée comme un processus de pertes cognitives et fonctionnelles. Cette croissance s'accompagne d'un taux élevé de maladies dégénératives chroniques, parmi lesquelles celles qui affectent le système nerveux central, notamment la dépression, qui est une «maladie» diagnostiqué des symptômes qui se manifestent une certaine durée, la fréquence et l'intensité. Considéré aujourd'hui comme le plus important pour les personnes âgées, des exercices de résistance (RE) remporte un rôle majeur en raison du degré élevé de sécurité et ses

stimuli à la santé cardiovasculaire et psychique. Dans ce contexte, cette étude vise à déterminer quels sont les effets de l'ER dans les symptômes dépressifs et la qualité de vie chez les adultes âgés 60 à 80 ans du projet ER et qualité de vie que vous lisez. Les données ont été recueillies par des questionnaires SF-36 et Yesavage échelle gériatrique (1983). Cette recherche a été menée à la lire, avec un échantillon de 30 volontaires âgés des deux sexes, qui sont divisés en deux groupes: un groupe expérimental (EG) et le groupe témoin (CG) du 15 âgées. Nous avons utilisé des statistiques descriptives pour présenter les données fréquence de distribution des différentes catégories de la dépression. Pour les statistiques inférentielles, nous avons utilisé le test t de Student et de test du chi carré pour analyser la différence entre les niveaux de classification de la dépression intra-groupe. Pour analyser l'inférence a été adopté un niveau de signification de $p \leqslant 0,05$. Il a été observé qu'il y avait une différence statistiquement significative entre les groupes, avec un avantage pour GE, qui a un meilleur indice de qualité de vie et pas de dépression. Il est conclu que la pratique de l'ER, semble favoriser les niveaux inférieurs de la dépression et améliorer la qualité des indices de vie.

**MOTS CLÉS:** personnes âgées, musculation symptômes dépressifs,.

**EL EFECTO DEL EJERCICIO DE RESISTENCIA EN LA CALIDAD DE VIDA Y LOS SÍNTOMAS DE LA DEPRESIÓN EN LOS ANCIANOS.**

**RESUMEN**

Los datos indican que la población mundial envejece. Esta fase de la vida se caracteriza como un proceso de pérdidas cognitivas y funcionales. Este crecimiento acompañado de una alta tasa de enfermedades crónicas degenerativas, entre ellas las que afectan al sistema nervioso central, especialmente la depresión, que es una "enfermedad" diagnosticada por los síntomas que manifiestan una cierta duración, la frecuencia y la intensidad. Considerado hoy como el más importante para los ancianos, el ejercicio de resistencia (RE) ha sufrido un importante papel debido a el alto grado de seguridad y sus estímulos para la salud cardiovascular y psicológica. En este contexto, este estudio tiene como objetivo determinar cuáles son los efectos de las ER en los síntomas depresivos y la calidad de vida en adultos mayores 60 a 80 años del Proyecto ER y Calidad de Vida de leer. Los datos fueron recolectados a través de cuestionarios SF-36 y la Escala Geriátrica de Yesavage (1983). Esta investigación se realizó en la lectura a través, con una muestra de 30 voluntarios mayores de ambos sexos, que se dividen en dos grupos: grupo experimental (GE) y grupo control (GC), de 15 ancianos. Se utilizó estadística descriptiva para presentar los datos de distribución de frecuencias de las diferentes clasificaciones de la depresión. Para la estadística inferencial se utilizó la prueba t de Student y la prueba de chi-cuadrado para analizar la diferencia entre los niveles de clasificación de grupo dentro de la depresión. Para analizar la inferencia se adoptó un nivel de significación de $p \leqslant 0,05$. Se observó que hubo una diferencia estadísticamente significativa entre los grupos, con la ventaja de GE, que mejor índice de calidad de vida y la depresión no. Se concluye que la práctica de la ER, parece favorecer a los niveles más bajos de la depresión y mejorar la calidad de los índices de la vida.

**PALABRAS CLAVE:** Ancianos, el entrenamiento de fuerza, los síntomas depresivos.

**OS EFEITOS DO EXERCÍCIO RESISTIDO NA QUALIDADE DE VIDA E NOS SINTOMAS DE DEPRESSÃO EM IDOSOS.**

**RESUMO**

Dados mundiais indicam o crescimento da população idosa. Essa fase da vida é caracterizada como um processo de perdas funcionais e cognitivas. Esse crescimento em acompanhado de um elevado índice de doenças crônico- degenerativas, dentre elas as que afetam o sistema Nervoso central, com destaque á depressão, que é uma "doença" diagnosticada a partir da presença de sintomas que se manifestam numa certa duração, freqüência e intensidade. Considerado, atualmente como o mais importantes para pessoas idosas, o Exercício Resistido (ER) ganha papel de destaque devido o alto grau de segurança e pelos seus estímulos à saúde cardiovascular e psicológica. Nesse contexto esta pesquisa tem por objetivo verificar quais os efeitos do ER nos sintomas de depressão e na qualidade de vida em idosos de 60 a 80 anos do Projeto ER e Qualidade de Vida do LERES. Os dados foram coletados através dos questionários SF-36 e Escala Geriátrica de Yesavage (1983). Esta pesquisa foi conduzida no LERES, com uma amostra de 30 idosos voluntários de ambos os sexos, sendo estes divididos em dois grupos distintos: Grupo Experimental (GE) e Grupo Controle (GC) de 15 idosos. Foi utilizada a estatística descritiva de freqüências para apresentar os dados da distribuição das diferentes classificações da depressão. Para a estatística inferencial utilizou-se o teste t de Student, e o teste do qui-quadrado para analisar a diferença entre os níveis de classificação da depressão intra-grupo. Para análise da inferência adotou-se um nível de significância de $p \leqslant 0,05$. Observou-se que ocorreu uma diferença estatisticamente significativa entre os grupos estudados, com vantagem para o GE, que apresentou melhores níveis de qualidade de vida e nenhum índice de depressão. Conclui-se que a pratica de ER, parece favorecer a diminuição dos níveis de depressão e melhorar os índices de qualidade de vida.

**PALAVRAS-CHAVES:** Idosos, Treinamento de Resistência, Sintomas Depressivos.