

EFFECTS OF DISTINCT PHYSICAL ACTIVITY AND MEDITATION PROGRAMS ON QUALITY OF LIFE AND DEPRESSION LEVELS IN ACTIVE ELDERLY WOMEN

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ABSTRACT

Sedentary aging can evolve to depression which interferes both qualitatively and quantitatively on elderly's quality of life. The present study compared quality of life and depression levels between sedentary and active elderly women. For this, a correlational ex post facto study was employed, the sample was divided in four groups: dance group (DG, n=23; age=70.79±6.36 years-old); weight training group; meditation group and control group. The protocols used in evaluations were World Health Organization Quality of Life Group-old questionnaire (quality of life) and Beck Depression Inventory (depression). In multiple comparisons the results found were satisfying ($p<0.05$) in dom2, dom3, QVG, dom1 and dom4 variables. Depression also revealed satisfying results: DGxCG (IC=-48.00,-8.86), WGxCG (IC=-53.55,-7.95) and MGxCG (IC=-61.71,-16.11). These results indicate that exercise programs have provoked satisfying results, contributing to better quality of life and depression levels when compared to those presented by the sedentary elderly women.

Key Words: quality of life; depression; weight training; meditation and dance

RESUMEN

Envejecer de manera sedentaria puede evolucionar hacia una depresión afectándose la calidad de vida de las personas mayores. El presente estudio comparó la calidad de vida y los niveles de depresión entre ancianas sedentarias y activas. Para esto, un estudio ex post facto fue aplicado, la muestra fue dividida en cuatro grupos: grupo de danza o aeróbico; grupo de entrenamiento de musculación o con resistencias; grupo de meditación y grupo control. Los protocolos empleados en las evaluaciones fueron el cuestionario de calidad de vida "World Health Organization Quality of Life Group-old" y el de determinación de depresión denominado "Beck Depression Inventory". En comparaciones múltiples los resultados fueron satisfactorios ($p<0.05$) en las variables dom2, dom3, QVG, dom1 y dom4. Al respecto de la depresión también se obtuvieron resultados satisfactorios: DGxCG (IC=-48.00,-8.86), RGxCG (IC=-53.55,-7.95) and MGxCG (IC=-61.71,-16.11). Estos resultados indican que los programas de ejercicio físico provocaron resultados satisfactorios que contribuían a una mejor calidad de vida y niveles de depresión en comparación con ancianas sedentarias.

Palabras claves: calidad de vida, depresión, entrenamiento de la fuerza, meditación y danza

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INTRODUCTION

The increase in life expectancy that occurred throughout the last years, has allowed a gradual and progressive aging in population, although it doesn't mean that the quality of life in elderly has increased (Dantas, Pereira, Aragão, & Ota, 2002). Many are the factors that can contribute to the natural aging process, but most part of this decline occurs due to physical inactivity and not by changes coming from aging itself (Cader, Vale, Monteiro, Pereira, & Dantas, 2006; Mussoll et al., 2002).

The disuse of physical activity or even permanent sedentary lifestyle in elder individual can evolve to depression (Hirvensalo et al., 2007). Depression can be considered one of the most commons psychics' events between elderly and can cause reduction of daily activities. It can be characterized by a set of signals and symptoms, such as: loss of interest, of pleasure in previously significant activities, energy reduction, somatic anxiety, terminal and intermediary insomnia, decrease in sexual interest, psychomotor retardation, cognitive difficulty, hopelessness, self-esteem decrease, suicidal ideation (Blay & Marinho, 2007; Magnus Lindwall, Mikael Rennemark, Anders Halling, Johan Berglund, & Peter Hassmén, 2006). All of these symptoms interfere both qualitatively and quantitatively in elderly's quality of life (Stella, Gobbi, Corazza, & Costa, 2002).

According to World Health Organization (WHO), quality of life is the individual's perceptions of their position in life in the context of the culture and value systems, in which they live and in relation to their goals, expectations, standards and concerns (Whoqol-group, 1998). In this way, it is a personal option to be pursued, defined according to its needs, hopes and possibilities, being subject to constant transformations.

The aging process varies sufficiently among people and is influenced both by genetic factors and lifestyle (Taberner, Villa, García, & Márquez, 2001). In this context, by keeping a healthy and active lifestyle, with physical activities' practice, the deleterious effects that come from aging will be prevented and minimized (Cader, Pereira, Vale, & Dantas, 2007; Díaz, Díaz, Acuña, Donoso, & Nowogrodsky, 2002; Misica, Rosengrena, Woods, & Evans, 2007; Pereira et al., 2007; Vallejo, Ferrer, & Fancello, 2006a).

This way, the objective of this study was to compare quality of life and depression levels between sedentary and active elderly women, practitioners of dance, weight training and meditation, also evaluating the effects of these exercises in these two groups.

METHOD

Participants

In this correlational ex post facto study, the random sample was composed by 72 elderly women volunteered to participate, some of them in physical activities

(dance and weight training) and the others were meditation practitioners at “Casa do Idoso” (Elderly House), from the municipal city hall of Belém do Pará’s health program. Also were sorted to participate in this research 24 volunteers sedentary elderly women living in the community near “Casa do Idoso”. However, after the exclusion criteria, this research had a non-response at the sample of 23 elderly people. In this way, the final sample was formed by 49 individuals divided in four groups: dance group (DG, $n=23$; $age=70.79\pm6.36$ years-old; $IMC=26.33\pm4.66$); weight training group (WG, $n=13$; $age=70.11\pm3.43$ years-old; $IMC=27.38\pm3.35$); meditation group (MG, $n=13$; $age=69.11\pm5.05$ years-old; $IMC=28.26\pm5.20$) and control group (CG, $n=20$; $age=67.67\pm16.82$ years-old; $IMC=25.34\pm6.71$).

Considered criteria for the elderly women inclusion were: meeting health requirements, free and informed consent referring to the objectives of this study; by active, the ones that achieved 75 % of presence in weight training, dance or meditation activities and being a practitioner of these classes for a minimum of six months; as sedentary, they could not have taken part in physical activities for at least three months (Kraemer et al., 2002; Lemmer et al., 2000; Raso, Matsudo, & Matsudo, 2001). The criteria for exclusion were any alterations or commitments that the elderly women related in a weekly evaluation document that could contaminate the results, as for example: unemployment, death of close friend or relative, or even disease. Also unauthorized to take part in the sample were elderly women that used medicine that could cause attention disorders.

This work also had some patterns that could influence its results, such as: absence, physical activity pattern and way of life, food, non identified and/or uncontrolled infirmity, and motivation. When possible, these limitations were controlled with interviews and counseling.

Although each exercise program was performed with a professional specialized in physical education, the researcher of this study himself compromised to control the dependent and independent variables as well as the intervenient ones from the study.

The present study attends to the Human Being Research Rules, from National Health Council, 196/96 that comply with the principles laid down in the 1996 Helsinki Declaration. Its project of research has been approved by Castelo Branco University Research Ethics Committee.

Procedure

To the evaluation of body mass, stature and calculation of the body mass index (BMI), a mechanical scale was used, with stadiometer, 100 grams (around 0.22 pounds) precision and 150 kilograms (around 330 pounds) capacity (Filizola, Brazil).

- *Depression evaluation*

The depression was evaluated by Beck Depression Inventory – BDI. This questionnaire consists of 21 groups of sentences, each one presenting four alternatives numbered from 0 to 3. The categories proprieties are: sadness, pessimism, failure sensation, lack of satisfaction, guilty sensation, punishment sensation, self depreciation, self accusations, suicidal ideas, crying crisis, irritabilities, social retraction, indecision, distortion of body image, inhibition at work, sleeping disturbance, fatigue, loss of appetite, loss of weight, somatic preoccupation e reduction of the libido. The sum of the 21 obtained scores results in the overall individual depression score; a higher score indicates a higher level of depression. The suggested cut points are: inferior to 10= no depression or minimum depression; from 10 to 18= depression, from mild to moderate; from 19 to 29 = depression from moderate to gravis; from 30 to 63 = serious depression. The instrument had its validity published in 1961 (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961).

- *Quality of life evaluation*

For this variable, the World Health Organization Quality of Life Group-old – WHOQOL-OLD questionnaire was used, which is subdivided into 6 domains: Sensorial Abilities (DOM1), Autonomy (DOM2), Past, Present and Future Activities (DOM3), Social Participation (DOM4), Death and Dying (DOM5), Intimacy (DOM6). These domains will result in the analysis of the overall quality of life – QVG (Fleck, Chachamovich, & Trentini, 2006).

- *Meditation Group*

The meditation was carried three times a week, with duration of 50 minutes per session. Starting from the sitting position, with eyes closed, listening to slow rhythm and soft volume music, the session was divided in three stages: (a) breathing control, with slow and deep breath. The aims of this technique were to reduce breathing rate and to learn how to mobilize in sequence—that is, within the same breath, the diaphragm, the lower chest, and then the upper chest during inhalation, and the same sequence during exhalation. This breathing was followed by concentration in several body parts, from head to pelvis; (b) mental repetition of the word “peace”, avoiding any other type of thought. The breathing rhythm was spontaneous. This phase was based in relaxing response’s technique and (c) this stage consisted of meditating in healthy and pleasant memories (Curiati et al., 2005).

- *Dance Group*

The ballroom dance lessons had 50 minutes of duration and took place 3 times a week. The rhythms were varied, such as foxtrot, waltz, rumba, swing, cha-cha and tango. Each dance contained five steps and the steps were arranged so that learning one dance step facilitated learning the next dance step. The basic structure of the lesson was the same for all the participants; however each elderly had her own development (progression), depending on its physical capacity, energy level, motivation and cognitive capacity. All the lessons were preceded by a warm up and stretching period and finished with relaxation (Haboush, Floyd, Joshua Caron, LaSota, & Alvarez, 2006).

- *Weight training group*

The GF carried their weight training program (2 x 8-10 repetitions; 75-85 % of 1-RM) with an alternate series by body segment of the following exercises: bench press (SR), leg press 450 (Leg 450), rear pull-up (PT), leg curl (FP), biceps twist with dumbbell (RB), leg extension (EP), triceps twist (RT) and abdominal crunches (ABD). The speed of execution varied from slow to moderate and the breathing used, more indicated in this age group, was from the “passive-elective” type (Westcott & Baechle, 2001) which consists of continuous breathing, ending in the concentric phase of the movement and inspiring in the eccentric phase. The increment of the training load was done according to the 2 x 2 rule recommended by (Baechle & Groves, 1992). It was used for performing these exercises equipment from the Vitally brand with plates ranging from 5kg and 10kg and dumbbells (Body and Sould, Brazil).

The frequency of exercises was three times a week, in alternate days and the session consisted of a warm up, main work and relaxation, which lasted approximately 50 minutes total (Pereira et al., 2007).

Statistical Treatment

The statistical treatment consisted of descriptive analysis through localization measures (mean) and dispersion ones (deviation). The normality of the sample was tested through the Shapiro-Wilk's inferential analysis. The homogeneity of variance was verified with Levene's test. To test the differences between groups, the Kruskal-Wallis' or ANOVA one way's test was used, when appropriate, followed by the multiple comparisons through the trust interval (IC), or Scheffe Post Hoc, respectively. The calculation of Spearman's coefficient of correlation evaluated the correlation between the BDI and the domains and QVG from WHOQOL-OLD. To evaluate the

internal consistency of BDI, it was used the Cronback's Alpha calculation. The statistics package SPSS 14.0 and Microsoft's Excell software were used.

RESULTS

Table 1 shows the descriptive data and Shapiro Wilk's inferential statistics of the sample. It can be observed that the variables dom1 (GD, GF and GC), dom2 (GD), dom3 (GM and GC), dom4 (GD), dom5 (GD, GF, GM and GC), dom6 (GD) e BDI (GD, GF and GM) presented a heterogeneous distribution of the data.

TABLE 1
Shapiro Wilk's descriptive and inferential analysis of the sample

		dom1	dom2	dom3	dom4	dom5	dom6	QVG	BDI
x	DG	18.57	17.39	17.04	17.57	17.39	15.39	17.22	2.78
	WG	17.15	15.00	16.69	17.31	16.15	13.00	15.88	2.23
	MG	16.85	17.15	17.77	17.92	17.15	14.00	16.81	0.69
	CG	15.75	12.75	14.35	14.55	15.90	14.20	14.58	13.10
e	DG	0.40	0.42	0.40	0.32	0.58	0.54	0.28	0.85
	WG	0.75	0.62	0.52	0.58	0.95	1.06	0.45	0.73
	MG	0.71	0.46	0.34	0.35	0.45	0.67	0.20	0.17
	CG	0.58	0.36	0.52	0.62	0.89	0.86	0.38	1.67
Md	DG	19.00	18.00	17.00	18.00	18.00	16.00	17.50	1.00
	WG	19.00	15.00	17.00	17.00	18.00	15.00	16.50	1.00
	MG	16.00	18.00	18.00	18.00	18.00	14.00	16.67	1.00
	CG	15.50	13.00	15.00	15.00	17.00	15.00	14.67	11.50
s	DG	1.93	1.99	1.94	1.53	2.78	2.61	1.32	4.06
	WG	2.70	2.24	1.89	2.10	3.44	3.81	1.62	2.62
	MG	2.54	1.68	1.24	1.26	1.63	2.42	0.71	0.63
	CG	2.61	1.62	2.32	2.76	3.96	3.83	1.72	7.45
SW	DG	0.001	0.032	0.237	0.040	0.001	0.016	0.557	0.001
	WG	0.011	0.669	0.246	0.238	0.003	0.307	0.227	0.007
	MG	0.101	0.527	0.037	0.297	0.001	0.882	0.343	0.004
	CG	0.013	0.573	0.048	0.246	0.004	0.255	0.387	0.064

DG: dance group; WG: weight training group; MG: meditation group; CG: control group; x= mean; e= standard error of the mean; Md= median; s= standard deviation; SW= statistics from Shapiro-Wilk's test; QVG= overall quality of life; Fac 1: Sensorial Functioning Facet; Fac 2: Autonomy Facet; Fac 3: Past, present and future Activities Facet; Fac 4: Social Participation Facet; Fac 5: Death and dying Facet; Fac 6: Intimacy Facet.

The variance homogeneity disclosed a heterogeneous distribution of the data in BDI ($p < 0,001$), dom1 ($p = 0,023$) and dom4 ($p = 0,009$). The results found indicate the convenience of using inferential statistics with non parametric instruments for the non homogeneous and parametric data to those that displayed normally.

This way, the ANOVA one way showed significant difference ($p < 0,001$) in dom2, dom3 and QVG variables and the Kruskal-Wallis' test in dom1 ($p < 0.008$) and dom4 ($p < 0.001$). In the multiple comparisons were found satisfying results in variables dom2 (DGxWG, $p = 0.026$; DGxCG, $p < 0.001$; WGxCG, $p = 0.015$; MGxCG, $p < 0.001$), dom3 (DGxCG, $p < 0.001$; WGxCG, $p = 0.014$; MGxCG, $p < 0.001$), QVG (DGxCG, $p < 0.001$; MGxCG, $p < 0.001$), dom1 (DGxCG, IC= +1.17,+40.31) and dom4 (DGxCG, IC=+2.26,+41.40; MGxCG, IC=+3.33,+48.93) –graph 1.

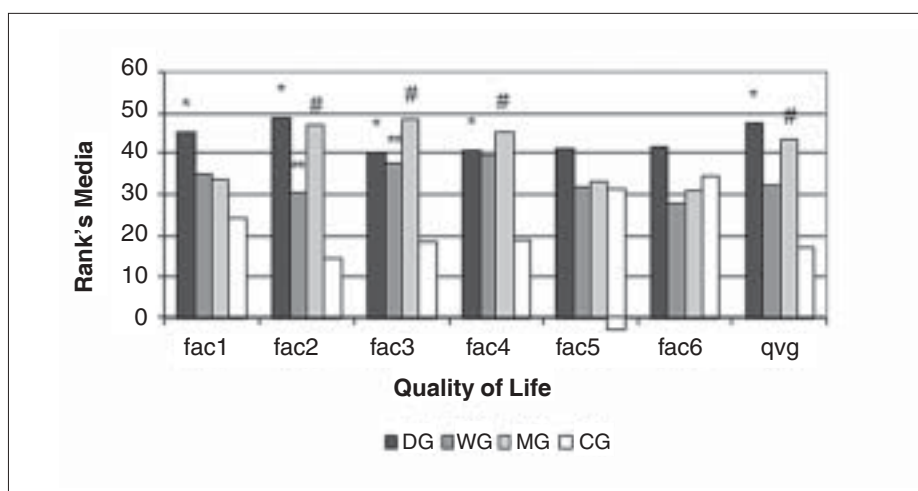


FIGURE 1: Evaluation of the differences by rank's media in Quality of Life questionnaire

* $p < 0,05$; DG x CG. ** $p < 0,05$; WG x CG. # $p < 0,05$; MG x CG

DG: dance group; WG: weight training group; MG: meditation group; CG: control group; Fac 1: Sensorial Functioning Facet; Fac 2: Autonomy Facet; Fac 3: Past, present and future Activities Facet; Fac 4: Social Participation Facet; Fac 5: Death and dying Facet; Fac 6: Intimacy Facet.

In the depression evaluation by DPI the Kruskal-Wallis' test disclosed significant difference ($p < 0.001$) between the groups. In the multiple comparisons, this difference was found between groups: DGxCG (IC=-48.00,-8.86), WGxCG (IC=-53.55,-7.95) and MGxCG (IC=-61.71,-16.11) - graph 2.

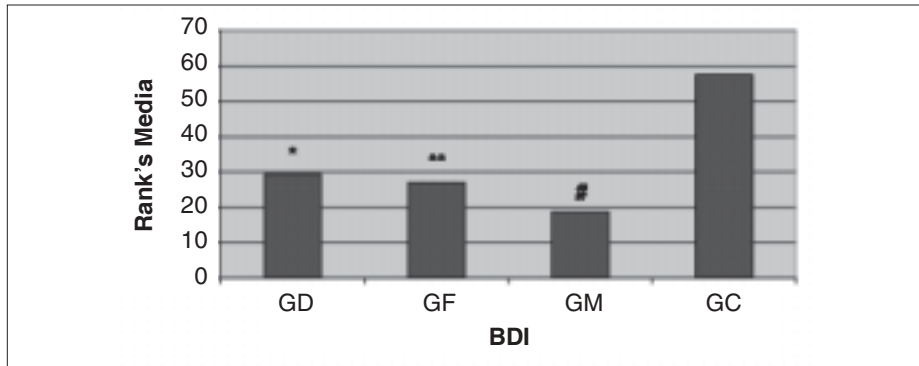


FIGURE 2: Evaluation of the differences by rank's media in Beck Depression Inventory

* $p < 0,05$; GD x GC. ** $p < 0,05$; GF x GC. # $p < 0,05$; GM x GC

GD: dance group; GF: weight training group; GM: meditation group; GC: control group; BDI: Beck Depression Inventory

In the correlation analysis carried through the calculation of Spearman's coefficient of correlation, amongst the significant values a negative correlation was observed: (a) low-average between DBI and dom1 and (b) average between BDI and dom2, dom3, dom4 and QVG (Sigmound, 1964) – table 2.

TABLE 2
Correlation between depression (BDI) and quality of life (WHOQOL-OLD)

		BDI
dom1	r	-0,244
	p-value	0,043
dom2	r	-0,527
	p-value	p<0,001
dom3	r	-0,474
	p-value	p<0,001
dom4	r	-0,430
	p-value	p<0,001
dom5	r	-0,144
	p-value	0,238
dom6	r	0,057
	p-value	0,639
QVG	r	-0,431
	p-value	p<0,001

Dom1: Sensorial Functioning Domain; Dom2: Autonomy Domain; Dom3: Past, present and future Activities Domain; Dom4: Social Participation Domain; Dom5: Death and dying Domain; Dom6: Intimacy Domain; BDI: Beck Depression Inventory

DISCUSSION

The increment of aging has shown, increasingly, a linear growth with the appearance of institutionalizations. In these asylums it is observed a very big optimization of inactivity, contributing to a greater dependence in AVD (Valdivieso, García-Martín, Ponce, & Rodríguez, 2002), which ultimately interferes with the quality of life as can be seen in graphic 1, specifically in facet 2. It is worth emphasizing that this functional autonomy (facet 2) is also impaired in the elderly that have change of body balance, due to the risk of falls, interfering with the quality of life. This concern was reported in a study that found a significant difference ($p < 0.05$) from the balance in a group of elderly submitted to a training program when compared to an inactive group (Sanchez-Garrido, Suarez, & Parra, 2006a).

The level of physical activity and the feeling of low self esteem have a significant and negative correlation, which was reported in a study by Ibarzábal (Ibarzábal, 2006a). This investigation analyzed the relation between body image (through the Body Shape Questionnaire - BSQ) and the self description of physical shape (Physical Self-Description Questionnaire - PSDQ) between sedentary women and practitioners of physical activity. These data show the same trend as those exposed in graphic 2.

The evaluation of the effects of the three activity groups (dance, meditation and weight training) on the quality of life and depression levels in elderly women had significant results ($p < 0.05$) when compared to the group of elderly women not inserted in any type of regular physical activity. In a revision, Stella et al. (Stella, Gobbi, Corazza, & Costa, 2002) observed that depression constitutes frequent mental disease in elderly, compromising intensely its quality of life. However, physical activity, when regular and well planned, contributes to the minimization of the psychic suffering of the depressed elderly and yet offers the opportunity of psychosocial involvement, self-esteem's elevation, cognitive functions' implementation, with the exit from the depressive state and lowest taxes of recurrence.

Mota et al. (2006) had the objective of comparing the quality of life level between elderly that were practitioners of a physical activity and those that did not take part in any. To do so, the questionnaire SF-36 was used as an instrument for evaluation of the quality of life. In their results, it was observed that the control group ($n=42$ elderly), sedentary, had a significantly lower punctuation in all domains of the test when compared to the experimental group ($n=46$ elderly), which took part in physical activity. These findings give support to those disclosed in the present research, therefore graph 1 shows that the groups that participated in any activity achieved satisfying results in relation to GC in dom1 (GD), dom2 (GD, GF e GM), dom3 (GD, GF e GM), dom4 (GD e GM) e QVG (GD e GM).

In a prospective study with elderly suffering from congestive cardiac insufficiency, through Minnesota Living with Heart Failure Questionnaire (MLWHFQ), a significant improvement ($p=0,02$) was observed in the experimental group's quality of life, which took part in meditation ($n=10$) when compared to the control group ($n=9$) (Curiati et al., 2005). In a similar way, Jayadevappa et al. (2007), in a sample with individuals with age > 55 year-old, observed that the meditation practice (experimental group, $n=13$) resulted in significant improvement of functional capacity ($p=0,034$), quality of life (SF-36 and MLWHFQ – $p<0,05$) and depression (Epidemiologic Studies Depression Scale - CES-D – $p=0,03$) when compared to the group of individuals that only participated in a "health education" lesson (control group, $n=10$). These data possess the same trend as those presented in graphs 1 and 2, which disclose that the meditation group obtained better results in quality of life and depression, respectively.

The results of the present study corroborate those found in a research made by Carta et al. (2008), with women suffering from depression. The authors evaluated the effect of a physical activity practice (mostly focusing in strength) in quality of life. The results demonstrated a significant improvement ($p<0,05$) in quality of life, by WHOQOL-bref's questionnaire, from the experimental group that took part in the physical activity, while the control group, that remained sedentary, only using antidepressant medicine, obtained no difference in the quality of life level.

Although there is necessity of bigger clarity on the neurobiological and psychological mechanisms involved in the recuperation from depression in elderly (Jagadheesan, Chakraborty, Sinha, & Nizamie, 2002), in the work of Mather et al. (2002) it was observed that the regular physical activity has contributed to the minimization of the psychic suffering caused by the depressive state. Similarly, in a retrospective research with 860 elderly (age= $75,3\pm 10,0$), it was observed that sedentary elderly possessed high scores ($p<0,05$) in depression evaluation by Montgomery Åsberg Depression Rating Scale (MADRS) when compared to those that practiced physical exercises many times a week, whether low or high intensity exercises (M. Lindwall, M. Rennemark, A. Halling, J. Berglund, & P. Hassmén, 2006). These data give support to those displayed in graph 2, which disclose that the groups that took part in physical activity possessed lowest scores in BDI.

The current research revealed that physical activity (dance and weight training) and meditation practice reflected in statistically satisfying results ($p<0,05$), both in quality of life and depression when compared to the GC. Antunes et al. (2005) evaluated the effects of aerobic training in quality life and depression levels in healthy elderly (age= $66,97\pm 4,80$ years-old). To do so, they divided their sample in experimental group (GE, $n=23$) and control group (GC, $n=23$). Depression was evaluated

by Geriatric Depression Scale (GDS) and quality of life by SF-36. All the variables from the SF-36 questionnaire and GDS presented a significant reduction ($p < 0,05$) both inside and between groups, favorable to GE.

Opposing the current study's data, Paw et al. (2004) observed that, as for elderly living in long-term care facilities, the isolated strength and recreation training did not reflect in significant improvement of neither quality of life (Dementia Quality of Life questionnaire - DQoL), nor depression (GDS). The significant result ($p < 0,05$) only occurred in the group that made a conjugated work, when compared to the control group.

CONCLUSION

After the data's exposition, it was inferred that the two physical activity programs (dance and weight training) and the meditation practice presented, in the analyzed sample, satisfying results, contributing to a better quality of life and depression level when compared to those presented by GC.

Additionally, it could be observed that Beck Depression Inventory presented itself as sensible method to attest the antidepressant effects from two physical activity groups: dance and weight training and especially from the regular practice of meditation, which obtained the lowest scores in depression, which contributed significantly to improve mental disposition. The evaluation of WHOQOL-OLD referent to the effects of physical activity programs on quality of life leaves no doubt that especially dance, but also weight training and meditation, have acted by elevating the quality of life levels in the elderly women that practice these activities.

REFERENCES

- Antunes, H. K. M., Stella, S. G., Santos, R. F., Bueno, O. F. A., & Mello, M. T. d. (2005). Depression, anxiety and quality of life scores in seniors after an endurance exercise program. *Rev Bras Psiquiatr*, 27(4), 266-271.
- Baechle, T. R., & Groves, B. R. (1992). *Weight training: steps to success*. Champaign: Human Kinetics.
- Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Arch Gen psychiatry*, 4, 596-571.
- Blay, L. S., & Marinho, V. (2007). Depressão na Terceira Idade: como diagnosticar e tratar. *Revista Brasileira de Medicina*, 64(4), 151-155.
- Cader, S. A., Pereira, F. D., Vale, R. G. S., & Dantas, E. H. M. (2007). Comparación de la fuerza de la musculatura inspiratoria entre mujeres mayores sedentarias y practicantes de hidrogimnasia. *Revista Espanhola de Geriatria e Gerontologia*, 42(5), 271-275.
- Cader, S. A., Vale, R. G. S., Monteiro, M., Pereira, F. F., & Dantas, E. H. M. (2006). Comparação da Pimáx e da qualidade de vida entre idosas sedentárias, asiladas e praticantes de hidroginástica. *Fitness & Performance Journal*, 5(2).

- Carta, M. G., Hardoy, M. C., Pilu, A., Sorba, M., Floris, A. L., Mannu, F. A., et al. (2008). Improving physical quality of life with group physical activity in the adjunctive treatment of major depressive disorder. *Clinical Practice and Epidemiology in Mental Health* 4(1), 1-6.
- Curiati, J. A., Bocchi, E., Freire, J. O., Arantes, A. C., Braga, M., Garcia, Y., et al. (2005). Meditation Reduces Sympathetic Activation and Improves the Quality of Life in Elderly Patients with Optimally Treated Heart Failure: A prospective Randomized Study. *The Journal Of Alternative And Complementary Medicine*, 11(3), 465-472.
- Dantas, E. H. M., Pereira, S. A. M., Aragão, J. C. B., & Ota, A. H. (2002). Perda da flexibilidade no idoso. *Fitness & Performance Journal* 1(3), 12-20.
- Díaz, D., Díaz, I., Acuña, C., Donoso, A., & Nowogrodsky, D. (2002). Evaluación de un programa de actividad física en adultos mayores. *Rev Esp Geriatr Gerontol*, 37(2), 87-92.
- Fleck, M., Chachamovich, E., & Trentini, C. (2006). Desenvolvimento e validação da versão em Português do módulo WHOQOL-OLD. *Revista da Saúde Pública*, 40(5), 785-791.
- Haboush, A., Floyd, M., Joshua Caron, LaSota, M., & Alvarez, K. (2006). Ballroom dance lessons for geriatric depression: an exploratory study. *The Arts in Psychotherapy*, 33, 89-97.
- Hirvensalo, M., Sakari-Rantala, R., Kallinenc, M., Leinonen, R., Lintunen, T., & Rantanen, T. (2007). Underlying Factors in the Association between Depressed Mood and Mobility Limitation in Older People. *Gerontology*, 53, 173-178.
- Ibarzábal, F. A. (2006a). Aspectos diferenciales en la imagen corporal y la autodescripción de la forma física en mujeres sedentarias vs. mujeres activas deportivamente. *Revista Motricidad*(15), 1-5.
- Jagadheesan, K., Chakraborty, S., Sinha, V. K., & Nizamie, S. H. (2002). Effects of exercise on depression in old age. *British Journal of Psychiatry*, 181, 532.
- Jayadevappa, R., Johnson, J. C., Bloom, B. S., Nidich, S., Desai, S., Chhatre, S., et al. (2007). Effectiveness of Transcendental Meditation on Functional Capacity and Quality of Life of African Americans with Congestive Heart Failure: A Randomized Control Study. *Ethn Dis*, 17(1), 72-77.
- Kraemer, W. J., Koziris, L. P., Ratamess, N. A., Hakkinen, K., Triplett-Mcbride, N. T., Fry, A. C., et al. (2002). Detraining produces minimal changes in physical performance and hormonal variables in recreationally strength-trained men. *Journal Strength and Conditioning Research*, 16(3), 373-382.
- Lemmer, J. T., Hurlut, D. E., Martel, G. F., Tracy, B. L., Ivey, F. M., Metter, E. J., et al. (2000). Age and gender responses to strength training and detraining. *Medicine and Science in Sports and Exercise*, 32(8), 1505-1512.
- Lindwall, M., Rennemark, M., Halling, A., Berglund, J., & Hassmén, P. (2006). Depression and Exercise in Elderly Men and Women: Findings From the Swedish National Study on Aging and Care. *Journal of Aging and Physical Activity*, 15(41-55).
- Lindwall, M., Rennemark, M., Halling, A., Berglund, J., & Hassmén, P. (2006). Depression and Exercise in Elderly Men and Women: Findings From the Swedish National Study on Aging and Care. *Journal of Aging and Physical Activity* 15, 41-55.

- Mather, A. S., Rodríguez, C., Guthrie, M. F., & al., e. (2002). Effects of exercise on depressive symptoms in older adults with poorly responsive depressive disorder. Randomized controlled trial. *British Journal of Psychiatry*, 180, 411-415.
- Misica, M. M., Rosengrena, K. S., Woodsa, J. A., & Evans, E. M. (2007). Muscle Quality, Aerobic Fitness and Fat Mass Predict Lower-Extremity Physical Function in Community-Dwelling Older Adults. *Gerontology*, 53, 260-266.
- Mota, J., Ribeiro, J. L., Carvalho, J., & Matos, M. G. (2006). Atividade física e qualidade de vida associada à saúde em idosos participantes e não participantes em programas regulares de atividade física. *Rev Brás Educ Fis Esp*, 20(3), 219-225.
- Mussoll, J., Espinosa, M., Quera, D., Serra, M., Pous, E., Villarroya, I., et al. (2002). Resultados de la aplicación en atención primaria de un protocolo de valoración geriátrica integral en ancianos de riesgo. *Rev Esp Geriatr Gerontol*, 37(5), 249-253.
- Paw, M. J. C. A., Poppel, M. N. v., Twisk, J. W., & Mechelen, W. V. (2004). Effects of resistance and all-round, functional training on quality of life, vitality and depression of older adults living in long-term care facilities: a 'randomized' controlled trial. *BMC Geriatrics* 4(5), 1-9.
- Pereira, F. F., Monteiro, N., Vale, R. G. d. S., Gomes, A. L. M., Novaes, J. d. S., Júnior, A. G. d. F., et al. (2007). Efecto del entrenamiento de fuerza sobre la autonomía funcional en mujeres mayores sanas. *Rev Esp Geriatr Gerontol*, 42(6), 319-324.
- Raso, V., Matsudo, S. M. M., & Matsudo, V. K. R. (2001). A força muscular de mulheres idosas decresce principalmente após oito semanas de interrupção de um programa de exercícios com pesos livres. *Revista Brasileira de Medicina no Esporte*, 7(6), 177-186.
- Sánchez-Garrido, E. R., Suárez, A. G., & Parra, M. O. (2006a). Valoración de la institucionalización de los sujetos ancianos en relación a su dependencia, en función de la capacidad para las actividades de la vida diaria. *Revista Motricidad*(15), 1-6.
- Sigmound, R. (1964). *Estatística não-paramétrica*. São Paulo: McGraw-Hill.
- Stella, F., Gobbi, S., Corazza, D. I., & Costa, J. L. R. (2002). Depressão no Idoso: Diagnóstico, Tratamento e Benefícios da Atividade Física. *Motriz*, 8(3), 91-98.
- Taberbero, B., Villa, J. G., García, J., & Márquez, S. (2001). Envejecimiento y composición corporal en mujeres participantes en un programa municipal de ejercicio físico. *Revista Motricidad*(7), 19-41.
- Valdivieso, C., García-Martín, J., Ponce, J., & Rodríguez, L. P. (2002). Valoración de la institucionalización de los sujetos ancianos en relación a su dependencia, en función de la capacidad para las actividades de la vida diaria. *Revista Motricidad*(8), 95-110.
- Vallejo, N. G., Ferrer, R. V., & Fancello, L. (2006a). Evolución de la condición física funcional de un grupo de personas mayores que realizan un programa de actividad física durante 9 meses. *Revista Motricidad*(15), 1-5.
- Westcott, W., & Baechle, T. (2001). *Treinamento de força para a terceira idade*. (1 ed.). São Paulo: Manole.
- Whoqol-group. (1998). Development of the World Health Organization WHOQOL-bref: Quality of Life Assessment. *Psychol Med*, 28, 551-558.

