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PHYSICAL EXERCISE DECREASES ANXIETY AND DEPRESSION IN POSTMENOPAUSAL WOMEN?

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ABSTRACT

The aging is an important human phase that physiological, psychological and social changes are evidence. In view of these changes, some reactions like stress, anxiety and symptoms of depression can be increase in this population. In the search to decrease such reactions, some activities, such as, yoga, mental activities, pharmacological treatment and the practice of systematic physical activity are proposed. However, specifically in physical exercises, the optimal volume and intensity for such practice is still a topic under discussion. The aim of this study was verified the effect of 16 weeks of systematic physical exercises in stress, anxiety and depression in hypertense and diabetic postmenopausal women. Twenty-two elderlies realized 16 weeks of systematic physical exercise (3 times/wk; 60min). Anthropometric parameters, using a measuring tape, and questionnaires for analysis mood disorders (depression, anxiety and stress) were measure pre and pos exercise program. Parametric and nonparametric tests were used to verify mean or median differences ($p \leq 0.05$). Results showed a significant decrease in stress, anxiety and depression in elderlies. Moreover, despite an increase in left forearm not contracted, it was observed a decrease in neck, shoulder waist and abdominal circumferences means/medians. after 120 days of systematic physical exercise. Our finding suggests that, independent of body composition results, a systematic physical exercise practice could be an important way of treatment of psychology disorders in elderly.

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INTRODUCTION

The aging is an individual, gradual and un reversed process in life. It is a process that involve biological, physiological, psychological and social changes (Fox, 1999; Annes *et al.*, 2017; Confortin *et al.*, 2019). In view of advances in the treatment of diseases, improving access for information and, changes in diary habits, studies have been demonstrating higher prevalence of elderlies all around the world. In 2010, there was more than 9 million of elderlies in Brazil, (IBGE, 2010). Its prevalence can be more than 41 million in 2030 overcoming the number of children and adolescents (Veiga *et al.*, 2019). This tendency demonstrates urgent interventions to guarantee quality of life for this population, resulting a less financial expense in hospitals and pharmacological treatments. Moreover, diseases linked to psychological and social disorders, such as anxiety and depression have shown significant increase, mainly in elderlies (Matias *et al.*, 2016; Perez-Sousa *et al.*, 2020).

Thus, some methods using non pharmacological methods and a physical exercise practice (Moreno Reyes *et al.*, 2020), demonstrating a positive association with improvement in quality of life (Joshua *et al.*, 2014; Rocha *et al.*, 2018; Kang, Bressel & Kim, 2020; Liu *et al.*, 2020). Recently, De Oliveira, Souza, Rodrigues *et al. (2019)* analysis the effect of physical activity in 200 elderlies in Cuiabá, MT. These authors, using two different questionnaires, showed that physical activity is a protective factor against anxiety and depression. However, the relationship of physical exercises and their effects in anxiety, depression and stress elderlies with comorbidities, like hypertension and diabetes, is still unclear in the literature. The aim of this study was investigated and analyze the effect of systematic physical exercise practice during 120 days in hypertense and diabetic elderlies.

METHODS

Ethical procedures: This study was approved by Ethics Committee in Research in Federal University of Sao Joao del-Rei (CAAE

79445717.7.0000.5151) in December, 15th, 2017, and was done July-December 2018.

Population and Sample: The population consisted in 35 (33 females) sedentary individuals registered in Basic Health Unit residents in District of Bonfim (Sao Joao del-Rei, Minas Gerais, Brazil). The inclusion criteria were: (a) postmenopausal female; (b) non active person in last 6 months and; (c) having a medical statement for authorizing physical exercises. The convenience sample was composed by 22 female individuals [67.1 (4.8) years, 26.42 (3,77) kg/m² and 21.03 (2.02) $mLO_2.kg^{-1}.min^{-1}$].

Training protocol: After gave written informed consent, the individuals participated in a systematic physical training program during 16 weeks [3 sections (50 minutes per sections) each week] and was carried out following the protocol suggested by Figueira et al (2012). This protocol consists in stretches, aerobic, resistance and relax exercises. The stretches (5min before the exercises) prior muscles and tendons of cervical and lumbar regions, upper and lower limbs, fists, shoulders and ankles. The aerobic exercises were done by stationary running and differences rhythmic of walking. The resistance exercises (three sets of ten repetitions with 30s of rest for each exercise) were realized with free weight, and the overload was measured and reviewed individually after 4 weeks. Finally, the relax exercises (5 minutes after exercises) by breath activities and soothing games with cognitive demands, for relax muscles and central nervous system, metabolic recovery and providing the readjustment of the emotional organic balance, were used.

Data collection: The psychological parameters were measured before and after physical exercise program by Depression anxiety and stress Scale (DASS), an instrument used for evaluated levels of depression, anxiety and stress suggested by Lovibond, Lovibond (1995). According these authors, this questionnaire has based in a tripartite model which symptoms of anxiety and depression are grouped in three basic structures: Negative affection like depress mood, insomnia, uncomfortable and irritability (anxiety and stress symptoms); Specific symptoms of depression like absence of positive affection and anhedonia and; Specific symptoms of anxiety (somatic tension and hyperactivity) (PATIAS *et al.*, 2016). In view of the limitations of sample (low level of education), a translated and validated short version with 21 items was used (VIGNOLA & TUCCI, 2014). The regional circumferences (neck, shoulder, chest, waist, abdominal, hip, forearm, arm, fist thigh and calf) were measure according Petroski (2011) using an inelastic tape (TR4010, Sanny®, Sao Paulo, SP, Brazil).

Analysis Statistical: Descriptive data are presented, for continuous variables, by mean values and standard deviation, or median and inter quartile. For categorical variables absolute and relative frequencies were used. Normal distribution of data and homogeneity of variance were determined by the Shapiro–Wilk and Levene's test, respectively. Statistical comparisons, between 2 groups, were performed using the Student's t test, Mann–Whitney U test or, Qui-Square test, as appropriate. The results were considered statistically significant at the 0.05 level.

RESULTS

Initially, the present study observed that more than 53%, 80% and 66% of the sample presents a very severity symptom of stress, anxiety and depression, respectively. After 120 days of physical exercise program, we observed a significant decrease in a prevalence of this disturbs (see figure).

Moreover, the analysis of 9 individuals' regional circumferences after 120 days of physical exercise program showed a significant decrease in neck, shoulder, waist abdominal, left and right arm not contracted ($p \leq 0.05$), and, curiously, an increase in left forearm not contracted (table 1).

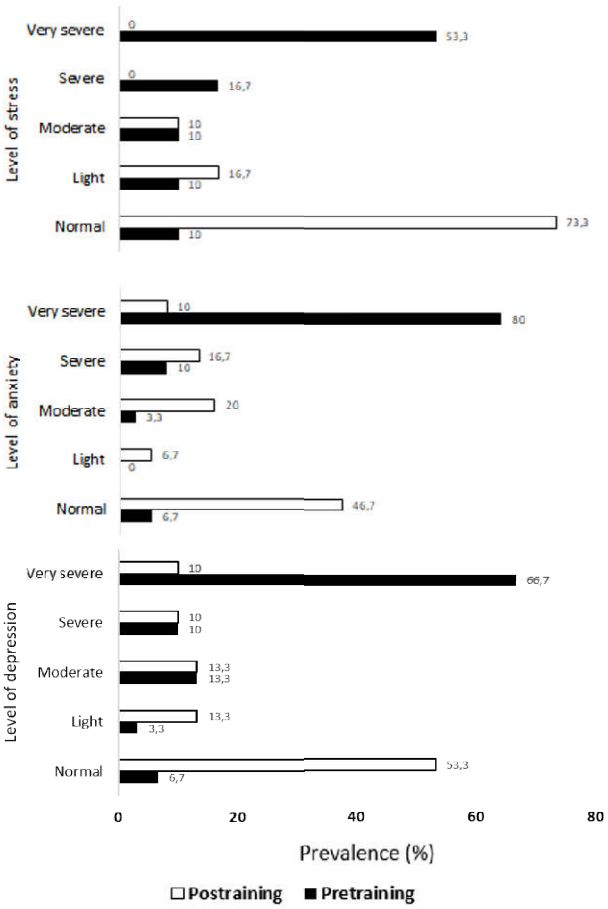

Figure: Prevalence of levels of stress, anxiety and depression before and after physical exercise program.

Table 1: Regional circumferences pre and post training (n=9)

	Pre-training	Post-training	Sig
Neck	33,05 (0,85)*	31,94 (0,63)	0,013**
Sholder	97,67 (3,43)	94,56 (3,50)	0,003**
Chest	85,72 (6,40)	88,56 (5,35)	0,118
Waist	86,22 (8,96)	80,33 (8,75)	0,050**
Abdominal	95 (9,29)	90,67 (9,11)	0,050**
Hip	98,22 (5,67)	98,33 (8,25)	0,926
Armnotcontracted (L)	27,0 (23,2-30,8)	25,5 (22,0-29,0)	0,011**
Armcontracted (L)	27,0 (23,7-30,3)	28,0 (27,75-31,25)	0,125
Armnotcontracted (R)	27,0 (23.7-30.3)	26,0 (23.25-28,75)	0,017**
Armcontracted (R)	28,0 (23,5-32.5)	28,5 (30,75-26,25)	0,282
Forearm (R)	21,5 (18,0-24,0)	24,0 (23,0-25,0)	0,063
Forearm (L)	21 (18,5-23,5)	23,0 (21,75-24.25)	0,035**
Fist (R)	15,5 (15,0-16,0)	15,5 (15,0-16,0)	0,129
Fist (L)	15,0 (14,0-16,0)	15,0 (14,6-15,4)	0,102
Thigh (R)	53,22 (5,9)	53,44 (5,10)	0,812
Thigh (L)	53,22 (5,43)	54,06 (4,72)	0,296
MediumThigh (R)	47,67 (3,65)	46,17 (3,77)	0,240
MediumThigh (L)	47,44 (3,84)	46,44 (3,33)	0,296
Calf (L)	33,56 (1,59)	34 (1,94)	0,312
Calf (R)	33,89 (2,19)	34,17 (2,26)	0,247

* data are expressed in mean and standard deviation or median and interval quartiles according normality; ** significant difference. R: right, L: left,

DISCUSSION

The aim of this study was verified the effect of physical exercise program in stress, anxiety and depression in hypertensives and diabetics elderlies. Our results demonstrated that 50 minutes of physical exercise 3 times per week during 120 days decreased the prevalence of these disturbs. Moreover, despite the low intense of exercise, and number of participants, the regional circumferences, mainly central parameters (waist, hip and shoulder) have an important decrease ($p<0,05$). Nowadays, psychological disturbs have been increased in different group aging. However, the prevalence of this disturbs in elderlies, like anxiety and depression, are evidenced. The

present study ratifies these results, which more than 80% of the sample initiated the physical exercise program showing very severe levels of stress and anxiety. For Annes et al. (2017), the third age could be a specific period with an increase of incidence for decrease cognitive, changing in physical aspect and psychological disturbs. Moreover, this vulnerable affects the mental health, promoting an anxiety, fear, sadness, anger, depress and stress (SANTOS *et al.*, 2015)

Despite some studies suggested an important effect of exercises in a psychological treatment disturbs, like anxiety and depression (WILLIAMS & GETTY, 1986; FOX, 1999), the real factor has not concluded. According these authors, others elements, like distraction, social life and self-efficacy could be an important element for the interruption of stressfully stimuli. According Kugler *et al.,* (1994)the physiology hypotheses that beta-endorphin and dopamine secretion after the exercises could be promote a relax and analgesic effect, contributing a positive mood state. Moreover, the contribution of monoamine in mood state had suggested by Ahrens *et al.,* (2007). In this case, the change of mood could be related of monoamine cerebral system resulting an increase of serotonin and activity of specific receptors. However, the psychological hypotheses shows that effects of physical exercise practice has been associated by an emotional interpretation, and benefits of the exercise could be happen by an individual motivation (SZABO, 2003). In the present study, the results showed that 120 days of physical exercise program promote an expressive decreased in depression, anxiety and stress symptoms. Despite these evidences, other that could involved must be observed carefully and, others parameters and/or biomarkers, like cortisol and dopamine level, could be relevant for understanding these findings by physiology aspects.

Our study suggest that exercise could be influenced in psychological parameters studied. This hypothesis has been grounded in fact that, all individuals, before this study, were inactive during 6 months and they did not modify their nutritional, pharmacological and diary habits during inactive and active period. However, the absence of group control could promote a vies and other studies with this group are needed.

In addition, the present study sought to analyze the anthropometric parameters (circumferences). The study of circumferences for anthropometric analysis, mainly in the elderly, has been used by several studies (CONFORTIN, MENEGHINI, ONO *et al.*, 2019; S *et al.*, 2019; CHIEN *et al.*, 2020). In elderly, there are no significant gains in muscle mass, and circumference and fat adiposity could be related. Unfortunately, in the present study, only 9 of 24 individuals participated in anthropometric measures (pre and pos training). Despite the number of samples, we observed a decreased in central circumferences (waist and abdominal) after training. This evidence was important, considering that, abdominal obesity is a primally factor for non-communicable diseases prevalence (CEOLIN *et al.*, 2019). Moreover, Barbosa *et al.* (2018) demonstrated that abdominal obesity predicts the mobility disability even over a short period. Thus, despite the sample, the anthropometric results point out for the importance of physical exercise for this group. As already mentioned, the present study showed some limitations: a) absence of the control group to ratify physical activity as the main factor in the results obtained; (b) small sample size, mainly, regarding the analysis of anthropometric measurements and; (c) Despite this study did not follow the participants' nutrition diet, they reported that did not changed their eating habits. However, other studies with this following are necessary. In conclusion, the physical exercise program suggested decrease the stress, anxiety and depression symptoms in hypertensive and diabetic elderlies. Moreover, our findings suggested that guiding physical exercise only 3 days per week can be an effective treatment to increase quality of life in this population.

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