


Pilates for elderly women: An improvement in functional mobility and balance

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ABSTRACT

This study intends to determine and relate the effects of a program of Pilates sessions in elderly women, comparing balance assessments by the Berg scale and physical mobility with the scale of Leighton for articular amplexness. Elderly evaluation was conducted by using a universal goniometer, the Berg scale, the Leighton scale and data collection was performed in two different moments. This study had 52 elderly women aged between 60 and 83 years. The participants had Pilates sessions of 30 minutes each, twice a week, for 6 months. The statistical analysis used were descriptive based on mean and standard deviation, statistical inference by applying the Wilcoxon and the effect size by Cohen's d where we observed an increase in balance parameters and articular mobility of elderly practitioners, with improvements from considered "average" in the first evaluation to "above average" in the second evaluation. The implemented Pilates program proved to be extremely favourable, with significant improvements in all analysed variables with intermediate and large effect sizes. **Keywords:** Pilates; Elderly; Balance; Physical mobility; Berg Scale; Leighton Scale.

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INTRODUCTION

Functional autonomy can be understood under the following aspects: autonomy of action is related to the physical independence or ability to perform day-to-day tasks; autonomy of will corresponds to individual self-determination; and autonomy of thought is the one that allows for the making of decisions and judgments. The preservation of these capacities influences the quality of life of the elderly (Emery, Serres, McMillan & Côté, 2010). In this study only functional autonomy was evaluated in the first sense. The Pilates method consists of physical exercises whose main characteristic is resistance work and dynamic stretching, performed in conjunction with breathing and respecting the following principles: control, precision, centring, fluidity of movement, concentration and respiration (Anderson & Specor, 2000; Sekendiz, Altuna, Korkusuza & Akinb, 2007). The method is aimed at strengthening the muscles located in the centre of the body (abdominal, paravertebral, gluteal and pelvic muscles), named after powerhouse creator Joseph Pilates. The Pilates Method proposal can be an improvement in the quality of life of its practitioners, through an optimized condition of a new posture, developing greater mobility, balance and agility.

MATERIAL AND METHODS

Participants

A number of 52 elderly participants aged between 60 and 83 years (mean 74.48 ± 7.36) have participated. They practice Pilates sessions of 30 minutes each, twice a week for a period of 6 months. This research did not offer physical or psychological risks to participants and all ethical issues were respected. All participants gave their free and informed consent in writing.

Measures

For elderly evaluation a universal goniometer was used to measure the joints of the participants, namely the shoulder joint (extension, flexion, adduction and abduction) and the thigh/knee joint (flexion, adduction and abduction). The results were classified according to the Leighton (1955) table, a classification table widely used to refer each individual in terms of the total amplexness of joint actions, for several articulations. With this table, the classification of each joint was verified, classifying it in low, below average, average, above average and high. Balance was also evaluated through the Berg Balance Scale (Berg & Norman, 1996), with the objective of evaluating the risk of fall, comprising a scale of 14 day-to-day tasks involving static and dynamic balance such as reaching, rotating, transferring, stand and get up. We only evaluated the tasks of "sitting to standing" and "standing".

Procedures

The elderly were subjected to a general evaluation (including age, weight and gender). It was necessary to use a universal goniometer and the results were compared with Leighton's table, which classifies the level of flexibility according to the degree obtained after the measurement, Marques (2003). The berg scale was applied after these evaluations in order to assess the risk of falls in the elderly and to relate this variable to their mobility. The evaluations were obtained in two moments between 6 months of Pilates practice.

Analysis

Descriptive statistics and the Wilcoxon test was applied for data analysis, for comparison between the two moments. Also, was performed the d Cohen's effect size to determine if this programme had significant practical effects on the variables under study.

RESULTS

Table 1. Comparison between the two evaluations and the effect size of the variables under study

Variables	Mean	sd	Sig.*	d Cohen
Shoulder Flexion/Extension (1 st)	229.67	18.10	0.001	0.546*
Shoulder Flexion/Extension (2 nd)	238.77	15.13		
Shoulder Adduction/abduction (1 st)	197.77	16.39	0.001	0.541*
Shoulder Adduction/abduction (2 nd)	206.69	18.47		
Thigh Flexion (1 st)	107.13	13.18	0.001	0.327
Thigh Flexion (2 nd)	111.98	16.32		
Thigh abduction (1 st)	57.27	7.24	0.001	1.68***
Thigh abduction (2 nd)	73.71	11.75		
Seating to standing (1 st)	3.60	0.49	0.001	1.15**
Seating to standing (2 nd)	4	0.00		
Standing for 2 min (1 st)	3.35	0.81	0.001	1.14**
Standing for 2 min (2 nd)	4	0.00		

*Wilcoxon $p \leq 0.005$ / *d Cohen intermediate effect / ** d Cohen large effect / *** d Cohen very large effect

DISCUSSION

The Pilates group had improvements in articular mobility and balance, as found by Silva et al. (2008). It is known that the act of sitting to standing requires strengthening of the muscles of the lower limbs, as well as the postural muscles (spinal stabilizers), in addition to flexibility, balance and coordination. In the getting up test, improvements were seen as studied in Kolyniak et al. (2000). With regard to the standing up variable, besides flexibility, balance and coordination were favourable, as was observed in Hall et al. (1999). The studies of Hall et al. (1999) and Johnson et al. (2007) have shown that Pilates practice can also promote the improvement of the dynamic balance of the elderly, by strengthening their muscles.

CONCLUSIONS

The Pilates method proves to be a complete, very effective tool for quality of life and health purposes. The results show that the practice of this activity applied to the elderly group of this study, promoted a significant improvement in their functional performance. It can be concluded that a 6-months Pilates program improved functional mobility and body balance, probably by strengthening the muscles involved in postural control.

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