



## EFFECTS OF AN ELEVEN-WEEK PILATES EXERCISE PROGRAM ON PROGRESSIVE-SPEED WALKING CAPACITY IN SEDENTARY YOUNG WOMEN: A PILOT STUDY

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ALAN QUEIROZ RODRIGUES<sup>1</sup>, FÁBIO MENDONÇA MARTINS<sup>1</sup>,  
ALEXANDRE CARVALHO BARBOSA<sup>2\*</sup>, PEDRO SCHEIDT FIGUEIREDO<sup>1</sup>,  
MÁRCIA OLIVEIRA LIMA<sup>1</sup>, EDGAR RAMOS VIEIRA<sup>3</sup>

<sup>1</sup> Department of Physical Therapy, Federal University of Jequitinhonha and Mucuri Valleys, Diamantina, Brazil

<sup>2</sup> Department of Physical Therapy, Federal University of Juiz de Fora, Governador Valadares, Brazil

<sup>3</sup> Department of Physical Therapy, Florida International University, Miami, USA

### ABSTRACT

**Purpose.** To assess the effects of an 11-week Pilates exercise program on the functional capacity of young sedentary women. **Methods.** Ten subjects underwent the shuttle walking test. A portable metabolic system was used during the shuttle walking test to measure the maximum heart rate and  $\text{VO}_2$  max. The heart rate recovery and the predicted maximal heart rate were also assessed. **Results.** The findings showed increased walking distance, maximum heart rate and heart rate recovery after completing the protocol. The peak of  $\text{VO}_2$  was not significantly different but showed a tendency to increase, being significantly correlated with the covered distance. **Conclusions.** The current results suggest that Pilates exercises significantly improve walking functional capacity.

**Key words:** heart rate, functional capacity, peak of  $\text{VO}_2$ , recovery

### Introduction

Pilates exercises are performed on a mat or using Pilates equipment to assist the subject to practice the exercises properly [1]. Pilates exercises include controlled breathing, concentration, and precision of the movement, tightening the core muscles including the abdominals, the lumbar multifidus and the pelvic floor muscles. The core muscles are responsible for static and dynamic stabilization, and are associated with breath control [2, 3]. The core muscles support the diaphragmatic function by activating the abdominals, and helping to increase lung volume and capacity [4].

A recent review found contradictory or inconclusive results on the effects of Pilates exercise on pain, quality of life and lower extremity endurance in women [3]. On the other hand, another review found strong evidence to support the use of Pilates exercises to improve flexibility and dynamic balance [5]. Recent studies found increased muscular endurance among subjects who started to practice Pilates exercises compared to inactive subjects and with subjects who maintained their normal activity routine [6, 7]. Also, some improvements in lower limb strength and muscle endurance were found in older adults and patients with fibromyalgia [8, 9]. Nevertheless, the effectiveness of Pilates exercises on increasing progressive-speed walking capacity needs to be further evaluated. Cardiopulmonary exercise (e.g. fast

walking) capacity can be used for exercise prescription [10]. The shuttle walking test can be used to evaluate the functional walking capacity of healthy and unhealthy subjects [11, 12]. This low-cost/easily administered test imposes a cardiopulmonary challenge; the information on change in walking speed is communicated to the participants using an audio signal for progressive effort to assess their functional walking capacity [10–13].

Pilates exercises are often used by health professionals (e.g. physical therapists) to treat patients, but further studies are needed to evaluate the benefits claimed by Pilates himself, including its potential effects on functional walking capacity [14]. Therefore, the aim of the study was to assess the effects of an 11-week Pilates exercise program on the functional capacity of young sedentary women. The hypothesis was that the Pilates exercises would increase the functional capacity of young sedentary women.

### Material and methods

#### Participants

A sample of ten healthy but sedentary young women participated in this study (Table 1). Subjects were recruited through public call at the city of Diamantina, Minas Gerais, Brazil. Inclusion criteria were: age between 18 and 21 years of age, weight between 50 and 70 kg, International Physical Activity Questionnaire – IPAQ [15] score classification as inactive or minimally active (sedentary lifestyle). The subjects were assessed by a trained physical therapist, and the exclusion criteria were: leg

\* Corresponding author.