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PROSPECTIVE CLINICAL STUDY

Effect of Pilates on sleep quality and quality of life of sedentary population

Amanda Aparecida Oliveira Leopoldino, MD Student , Núbia Carelli Pereira Avelar, PhD Student*, Gabriela Basques Passos Jr, Natália Ágatta Perácio Santana Jr, Vanessa Pereira Teixeira Jr, Vanessa Pereira de Lima, PhD Student , Débora Fernandes de Melo Vitorino, PhD

Federal University of the Jequitinhonha and Mucuri Valleys, Healthy and Biological Sciences Faculty, Department of Physiotherapy, UFVJM — Gloria's Street, n°187, 39100-000 Diamantina, MG, Brazil

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Summary The purpose of this study was to investigate the effects of an exercise program based on the Pilates Matwork method on sedentary volunteers who self-reported changes in their sleep quality and quality of life. This was a prospective clinical study, in which the variables (level of sleepiness and quality of life) were compared before and after applying a protocol of 12 weeks of an exercise program (2 sessions per week). The level of sleepiness showed significant improvement between before and after the intervention (p: 0.04). Quality of life improved based on all of the emotional components and the physical components ($p < 0.05$) with the exception of the physical domain (p: 0.09). The results of this study indicate that the sedentary population who participated in this 12 week Pilates program experienced improvements in sleep quality and quality of life.

Introduction

Physical exercise has become a consensus in the promotion of health and in improving quality of life and acts as a key factor in increasing longevity and improving sleep quality and quality and life (Haskell et al., 2007; McGrath et al., 2011; Teculescu et al., 2010). However, disturbances in the sleep–wake cycle and quality of life are becoming more frequent (Lund et al., 2011).

Therefore, increasing focus has been given to treatments that improve these two aspects and suggest the importance of physical exercise (Hurley et al., 2010).

* Corresponding author. Tel.: +55 38 35321239.
E-mail address: nubia-carelli@ig.com.br (N.C.P. Avelar).

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Accordingly, the Pilates method has emerged as an alternative form of exercise to improve sleep quality and quality of life (Caldwell et al., 2010; Caldwell et al., 2009; Siqueira et al., 2010). There are several ways to perform this technique on devices or on a mat. Some studies have used this modality because exercise on a mat is easy to use, and the Pilates method does not require additional costs for the acquisition of equipment (Rogers and Gibson 2009; Critchley et al., 2011; Menacho et al., 2010). There is evidence that Pilates Matwork exercises increase the electromyographic activity of abdominal (Rogers and Gibson 2009) or postural muscles (Critchley et al., 2011), body fat percentage and flexibility (Siqueira et al., 2010).

However, no previous studies have evaluated the effectiveness of Pilates Matwork exercises by assessing the self-reported sleep quality and quality of life in sedentary volunteers. Therefore, the purpose of the current study was to investigate the effects of an exercise program that was based on the Pilates Matwork method with sedentary volunteers who self-reported changes in the sleep quality and quality of life. The hypothesis was that an exercise program that was based on the Pilates Matwork method would improve the sleep quality and quality of life on sedentary population in the context of a within-group, pre- to post-test comparison.

Methods

Design

This was a prospective clinical study, in which the variables were compared before and after applying a protocol of 12 weeks of an exercise program based on the Pilates Matwork method with a sedentary population. The current study was approved by the Ethics in Research of Federal University of Jequitinhonha and Mucuri Valleys (#088/10).

Participants

To participate in the study, volunteers were required to meet the following inclusion criteria: they were aged between 18 and 30 years, lacked self-reported metabolic disorders or other diseases that might interfere with the exercises, were sedentary according to the International Physical Activity Questionnaire (IPAQ) (Matsudo et al., 2001) and did not undergo any surgical procedure in the last 6 months. Volunteers were excluded if they had any orthopedic, neurological, respiratory or acute cardiac diseases that would preclude the study.

Of the 96 volunteers evaluated, 30 volunteers fulfilled the criteria for inclusion that was proposed and were submitted to an initial assessment using the application of the Epworth Sleepiness Scale (ESS) (Bertolazzi et al., 2009; John, 1991) and The Medical Outcomes Study 36 - Item Short Form Health Survey (SF-36) (Ciconelli et al., 1999).

Evaluation

Epworth Sleepiness Scale (ESS)

The ESS suggested the possibility of some sleep disorders (John, 1991), which was valid for the Brazilian population (Bertolazzi et al., 2009), in which the examiner uses a punctuation varying from 0 to 3, where the punctuation ranges from 0 to 24. Excessive sleepiness was characterized by values over 10 (ICC: 0.83) (Bertolazzi et al., 2009).

Item Short Form Health Survey (SF-36)

The SF-36 is a multidimensional test that is comprised of 36 items that are divided into physical and emotional components and evaluates eight of the main domains that are related to health. In each domain, the punctuation varied from 0 to 100. A higher score indicated a better quality of life. It is valid and has been adapted for the Brazilian culture. (ICC: 0.8) (Ciconelli et al., 1999).

The training protocol

The training exercises that have been adapted from the Pilates method had a frequency of 2 sessions per week for an uninterrupted period of 12 weeks (Siqueira et al., 2010) with a duration of 60 min per session.

The exercise protocol was based on the principles of progressive loading, which describes a gradual increase in the intensity of exercise from the sixth week of training with an increased time of protocol execution and a decrease in the intervals of rest. Each session consisted of the following phases: phase 1 (preparation exercises), phase 2 (Pilates Matwork exercises) and phase 3 (relaxation).

Phase 1: Preparatory exercises (Avelar et al., 2010).
Walking: gait with progressive speed, up to 3 min.
Stretching (the stretching positions were sustained for 30 s):
Stretching of the hamstring muscles
Position: orthostatic position with the back resting against the wall.
Activity: to perform spinal flexion, while keeping the lower limbs stretched out.
Stretching of the rectus femoris
Position: orthostatic position with both hands resting against the wall.
Activity: to perform knee flexion, sustaining it with the aid of the ipsilateral upper limb, in association with hip extension.
Phase 2: Pilates Matwork exercises (Fig. 1): All exercises are based on core stabilization and associated with specific breathing.
The exercises A–C were realized with 2 sets of 10 repetitions and the progression was realized by modifying the volunteer's body.
Exercise A: Anterior flexion of trunk with knees and upper limbs in extension.
Progression: The progression of the exercise was performed with the extension of the lower limbs occurring closer to the ground in order to activate the lower abdominal muscle.
Exercise B: Elevation of the ball with the lower limbs.
Progression: Associate exercise with trunk flexion and extension of upper limbs holding a small ball.
Exercise C: Flexion of upper limbs.
Progression: Position the ball at the ankles.
The exercises D–G were progressed only with increasing the number of repetitions: 2 sets of 8 repetitions to 2 sets of 12 repetitions.