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Original article

BENEFITS OF USING PILATES APPARATUS IN MOTOR ACTIVITIES FOR KEEPING FIT

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Abstract*

Aim. Motor activities for keeping fit mainly aim to promote education through and for movement, and also to shape public opinion towards knowing and appreciating the benefits of practicing them to maintain health. One of the motor activities which is increasingly developing at a global and national level is "Pilates", a method of complex body conditioning, which involves harmonization of the relationship between body and mind. Also called "intelligent gymnastics", Pilates method can be practiced by anyone, regardless of age, gender or physical fitness.

Pilates increases muscle tone, joint mobility, improves posture, blood flow, and reduces stress levels. It is therefore an excellent workout for all those who want a beautiful and healthy body, in harmony with their mind: performance athletes, people who want to keep fit, pregnant women and new mothers, persons with minor joint disorders, etc.

The practice of Pilates using specific apparatus brings an extra value to method application, because its construction and the varied range of motor intervention possibilities ensure better localisation of movement, control over the muscle activity and biomechanics of motion, posture correction and improvement of balance, of inter-muscular and intersegmental coordination.

Purpose of the research. The purpose of our theoretical approach is to argue the value and benefits of exercises performed on Pilates apparatus for people willing to improve their lifestyle by consistently practicing motor activities that help them stay fit.

Conclusions. Pilates equipment increases the interest in movement, stimulates active and conscious participation, the desire for correct execution and success.

Exercises using different *Reformer* types provide variety and ensure better action on the movement parameters (accuracy, direction, range of motion, degree of tension and relaxation), in parallel with the development of motor abilities, prevention/correction of physical disabilities, while inducing a general state of wellbeing.

Keywords: Pilates, apparatus, Reformer, posture, motor ability.

Introduction

"Movement is life, life is movement" is the motto of the Romanian Federation Sport for All, and it can be regarded as a quintessence of the influences exerted by motor activities for keeping fit on the human body.

Performed in order to reach a state of wellbeing and ensure a healthy biological condition, motor activities for fitness maintenance are increasingly diversified, the market offer trying to provide practitioners with more and more options that correspond to various preferences.

All this variety is retrieved under the incidence of one of the definitions given to movement, which considers that human motion represents the body movement that is "goal-oriented, stimulated and supported by motives" and should be discussed from three perspectives: as a state-related phenomenon, a function of the locomotor apparatus, and a complex mechanism within which the biological relates to social and

cultural spheres. (Epuran, 2011)

Regarded from this angle, motor activity for staying fit mainly aims to promote education through and for movement, and also to shape public opinion towards knowing and appreciating the benefits derived from the practice of various forms of motor activities for fitness maintenance. (Macovei, Ganciu, Ganciu, 2010)

In modern society, which is dominated by 3 factors - sedentariness, overstrain and overeating, "Mens sana in corpore sano", as a slogan that has accompanied the anthropological evolution of man for centuries, is as true as it is topical. The slogan supports the need to maintain a healthy body also as a factor promoting mental health. And health, which can be seen as the "quietness of the body" (Epuran, 2011), involves harmonizing the body-mind relationship, which can be achieved by practicing a wide range of maintenance exercises. In this context, the goal-oriented movement, motivated by the desire to improve functionality of

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the whole body, but also by the trends towards autoplasty, improvement of external characteristics, self-image, posture and attitude of the body in motion, can be considered a real "natural medicine". (Macovei, 2008)

And the concept of fitness, interpreted as physical ability or physical condition, should also be associated with the attributes of mental sphere, the references mainly aiming at self-management and self-regulation. (Epuran, 2011) Thus, fitness could be defined by the "increased ability to adapt to the life conditions using physical exercises and self-education means". (Epuran, 2011)

The improvement of kinaesthetic perception, the education of postural and movement control based on complex mechanisms which can be developed/enhanced throughout the human ontogenesis provided that appropriate methods and means are used. One of the priority activities addressing these issues is "Pilates method", considered by many specialists as the ideal system that equally involves body and mind. It can be regarded as "a form of intelligent gymnastics", which primarily aims at toning and making the deep muscles suppler. (Macovei, Ganciu, Ganciu, 2010)

With a strong impact on the motor activities practiced by adult population, Pilates helps people become aware and know their body. Those who practice it learn to recognize the body signals, which tell us what is good and what is not. We must always take into account what our body "tells" us. Not accidentally, the creator of this method thought that "*to be happy, it is absolutely necessary to become the master of your own body*" (Silver, 2011). This conception is reinforced by some important pillars of a healthy and balanced lifestyle, namely movement, healthy diet and relaxation. (Traczinski, Polster, 2013)

The accessibility of Pilates programmes is also due to the characteristics of training, which apparently is easy, with exercises performed slowly, in a controlled way. Their benefits mainly address the core strength represented by the abdominal, dorsal, lumbar and gluteal muscles, through which tensions in the lumbar spine are removed (Dobrescu, 2008). Given the possibility of adapting exercises to any person, regardless of age, physical fitness or motor experience (Traczinski, Polster, 2013), Pilates acts for the muscle toning, posture optimization, improvement of body and mental balance, and suppleness as well. (Silver, 2011)

Purpose of the paper

We aim to argue, from a theoretical perspective, the value and benefits of exercises on Pilates apparatus for people who want to improve

their lifestyle through the consistent practice of motor activities for keeping fit.

Stage of knowledge

The inventor of this method, Joseph Hubertus Pilates (1883-1967), born near Dusseldorf, was a movement follower by virtue of his sufferings during childhood, caused by asthma and rickets. Thus, the promotion of motor activities as a means for strengthening health was due to his desire to compensate for personal inabilities and become a complete athlete. (Calais-Germain, Raison, 2013)

The method relies on his experiences accumulated during World War I, when he was held prisoner in England, together with other German compatriots, and laid the basis for a system of exercises to recover the wounded soldiers. Authorized to care for those patients, he thought to equip the bedframes with a system of springs and straps to provide them movement possibilities that would not hinder the recovery of injuries. The patients had the opportunity to perform various movements at the segmental level against the resistance of those springs, which was stimulating their muscle and joint activity, and therefore their recovery period was becoming shorter. At the end of the war, Pilates went back to Germany and trained athletes, soldiers, policemen. (John, 2009)

But Pilates method was developed starting with 1925, in the United States of America, where, after he met his future wife, Clara, they opened together a studio on 8th Avenue, in New York. (John, 2007)

The philosophy of this method consists in the complex integration and engagement of the entire human body in a system of exercises that joins the physical and mental spheres, improving general health status and consequently physical fitness. The system includes exercises for each part of the body and applications for diverse categories of activities. (John, 2007) Choosing the muscle groups, working positions and movements is not done randomly. It involves establishing an accurate segmental placement rigorously set in planes, axes and directions of movement, with the complex alternation of muscle contraction, relaxation and stretching activity. (Isacowitz, Karen, 2011)

The method was conceived as a way of connecting and developing simultaneously the "body and mind", and special attention was paid to breathing and strengthening core muscles, with a focus on the abdominal area, vertebral column and pelvis placement in a neutral position. (John, 2006)

The extensive development of Pilates, as a training method, in recent years, is also due to the increasingly visible results it has provided after a

relatively short period of time. As stated by J. Pilates, “After 10 sessions, you will feel the difference, after 20 sessions, you will see the difference, and after 30 sessions, you will have a totally new body” (Silver, 2011). If these benefits had not been true, certainly that Pilates would not have gathered so many fans all over the world. Only in the United States of America, in 2000, there were 1.7 million practitioners of Pilates, in 2006, their number increased to 10.6 million, and in 2015, to more than 30 million. We do not know about similar statistics for Romania, but our interest in developing this field is obvious and has grown in recent years. There are organized specialized courses taught by lecturers with experience and international accreditations, conventions with demonstrative programmes, and there are opened Pilates studios that provide programmes to be performed on the floor or on specific apparatus.

Perspectives in the field

Pilates method is a well-structured body preparation concept, which has specific principles and action systems, as well as methodical procedures differentiated by their way of acting. Exercises can be performed either on the floor, freely or with various objects (fitball, foam rolling, softball, elastic bands, etc.) or using the equipment (Reformer, Cadillac or Barrel).

Overall, the method acts equally as a prophylactic system for developing and keeping the

physical and mental condition, therefore the health status, and as a therapeutic system that aims at medical rehabilitation in different disorders (at the muscle and joint levels, dysfunctions at the spine level, etc.). (Tache, 2011)

Exercises are intended for general fitness, regarded as the totality of components defining an active life characterized by health and low risk of disease, good exercise capacity, a state of wellbeing and efficiency in the activity carried out (Bota, 2006). We could name it the optimal state that provides an individual with the attributes required for coping with the demands of life.

If we refer to the components of physical fitness, as discussed by Epuran (2011) and shown in figure no.1, we can assert that Pilates method, regardless of the variants of exercises used, fully ensures the “health” component by improving body composition, cardio-respiratory fitness (due to breath control and continuity in movement execution), and developing muscle suppleness and endurance. From the perspective of motor component, the priorities are: balance, intersegmental, intermuscular and intramuscular coordination, kinaesthetic sense, muscle tone. But the advantage of this method comes from the mental engagement and the development of the ability to control and become aware of one’s body in its whole.

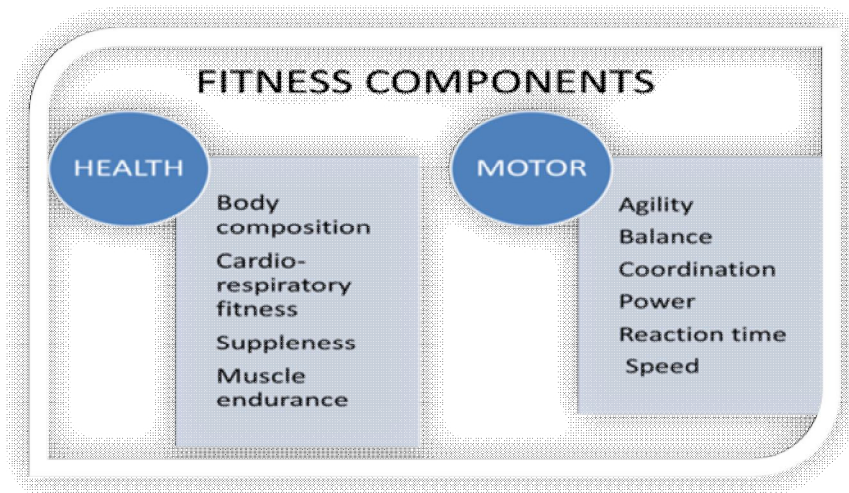


Figure no. 1. Fitness components (according to Epuran, 2011)

As any well-defined method, Pilates has well-structured principles (Silver, 2011), whose systematization is presented in table no. 1.



Table no. 1. Systematization of Pilates method principles

Principles	Significance
Breathing	It is integrated into each movement, is achieved consciously and has the role of activating the rib cage muscles, improving lung capacity and blood flow. Breathing has the most important role in the Pilates method, being considered a fuel for the “powerhouse”, the engine that puts the body in motion. (Silver, 2011)
Concentration	As a basic element, it guides the attention towards the own body, focusing on each movement and muscle group engaged in the exercise, while being aware of one’s breathing, posture and correct execution. Practically, this principle distinguishes between Pilates method and the remaining methods. Joseph Pilates also called his method “the thinking man’s training”. (http://www.happycorapilates.com/ro/pilates/articol/9)
Control	It represents the basic idea from which Joseph Pilates started: control of posture, pelvis position, muscle action, breathing, movement accuracy in planes and axes. Movements are homogeneously ordered and respect the laws of biomechanics and human anatomy.
Centring	The action is always focused on the trunk, at the level of “core” strength area (abdomen and lumbar belt), is essential for stability and specifically exerts the transverse muscle activity, a deep muscle stabilizing the abdominal belt.
Precision	It is the proper way in which each exercise must be performed. It starts from the body position, segmental placement and body alignment, and involves knowing the muscles engaged in exercise. Precision can make the difference between activating correctly or not a muscle and/or muscle group. Relating to this principle, J. Pilates said: “Some well-thought movements, properly performed in a balanced sequencing, are equivalent to full hours of negligent physical training or forced contortions”. (http://www.happycorapilates.com/ro/pilates/articol/9)
Muscle balancing	It is the principle leading to improved posture and the development of motor abilities and physical fitness.
Flow	It involves continuity in the exercise sequencing, correlated with breathing, and can be described as a “flowing movement outward from a strong core”. (http://www.happycorapilates.com/ro/pilates/articol/9) Through these attributes, flow aims at elegant economy of movement.
Full engagement	It refers to integrating the body into the mental sphere in order to develop perfect balance.
Relaxation	Maintenance of a healthy lifestyle involves understanding the importance of keeping balance between the effort made by a person and the relaxation methods used. Through the accurate localisation of movements, the control of muscle activity and breathing, the practitioners learn to direct their effort, to use just the energy needed, neither more nor less of it.

Nowadays, motor activities for keeping fit have broadened their scope, the “fitness” industry striving to create innovative methods, programmes as diversified as possible, trendy working systems correlated with the classical ones.

The healthiest motor activities are those from which the body benefits most, namely those that leave their mark on the physical, mental and structural wellbeing of the body. In this context, the success of Pilates method during more than nine decades proves to be a viable option, tested and validated by consistent results. Designed to create a body, a mind and a healthy lifestyle, it prepares the

practitioners to know the messages of their body and become aware of the multiple benefits it brings to the body in its whole. (Silver, 2011)

Utilitarian applications

Pilates primarily means a state of wellbeing and its great advantage is that it provides personalized programmes, perfectly tailored to the needs of each practitioner. In the attempt to create an acrostic, without introducing the rhythmic aspect, we can characterize “Pilates” by the words in figure no. 2.

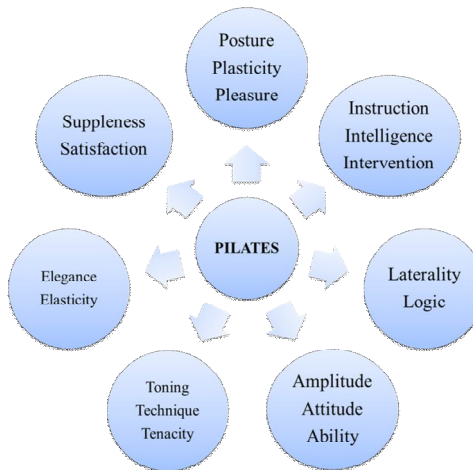


Figure no. 2. Acrostic for the term “Pilates”

In motor activities for fitness maintenance, the use of Pilates apparatus is growing, the drawback coming from the relatively high cost of the investment. On the other hand, the programmes are personalized and the work is done individually or in small groups. But the value of exercises compensates for these drawbacks. Generally, the benefits of using Pilates apparatus is expressed by:

- A very accurate localisation of working position due to the system of springs and accessories, which leads to improved body attitude, control and awareness.
- Efficient muscle training due to the alternate and balanced exertion of all types of contraction: eccentric-concentric, isometric-isotonic. Spring systems can be adjusted and adapted to the possibilities of each practitioner for the given moment, and they

mainly develop muscle tone, intramuscular and intermuscular coordination. The ability to recruit muscle fibres during exercise also improves.

- Efficient training of body suppleness through an improved relationship between contraction-stretching-relaxation.
- Depending on the type of Pilates equipment used, muscles can be trained in a differentiated way, from small/medium muscle groups to large groups and kinematic chains.
- Adaptability of the programme to adult people of any age or gender, either healthy or with locomotor disorders, pregnant women, etc.

Pilates equipment is represented by many types of beds and seats with various accessories, as shown in figure no. 3.

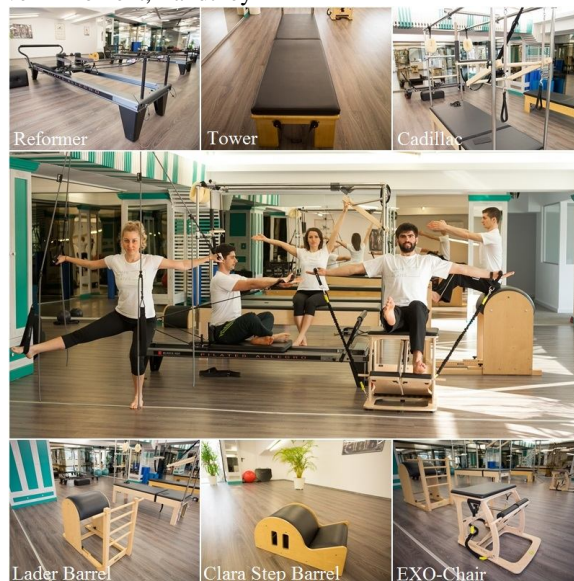


Figure no. 3. Presentation of Pilates equipment



Pilates Reformer

Invented by Joseph Pilates, Reformer is similar to a flat-platform bed called "carriage", which moves back and forth on a frame rolling system. The carriage is attached to one end of the apparatus by a set of springs. They allow the differentiated selection of resistance while the carriage glides along the frame. The apparatus has 5 springs distributed by colour: one is yellow - the lowest resistance, one is blue - a moderate level, and three are red - the toughest ones. Body weight and spring resistance determine the difficulty level of the working task. The apparatus is equipped with fastening systems for the practitioner's body, which localise very well the position and muscle area, and also with bars and rope that can be used at the level of upper and lower limbs, and are adaptable to each one's body size.

The offer is generous in movements, and the action on the muscles around the power centre is maximal. The action specificity consists in the eccentric contraction that develops strength, elasticity, coordination and body balance through the specific demands of the deep stabilizing muscles, which provides stability and support for the entire skeletal system. The engagement of muscle groups and segments is symmetrical, with effects on removing physical imbalances and joint pains. An immediate benefit is the control of one's body, which is felt just after the first training lesson.

Cadillac

This is a platform bed framed in its corners by 4 metallic vertical bars and 5 horizontal bars attached to the vertical ones, forming a rectangular parallelepiped. The apparatus is also equipped with an adjustable bar fixed to the horizontal bars at one end and a bar that describes a circular arc at the other end. The bar describing the circular arc has a strap with a protection karabiner. Almost all the Cadillac bars have small screws to which the 10 types of springs can be attached. It has various accessories for arm stretching and holding in the desired positions, and also bars to support the feet and leg. The apparatus provides the opportunity to work in the lying, sitting, standing or hanging position using the body weight and spring weight.

One variant of Cadillac is Studio Reformer with Tower, which, instead of 4 vertical bars, has only 2 bars at one end, with a single horizontal bar above. Practically, this apparatus is "2 in 1", because it can be disassembled and turned into a Reformer with all necessary accessories. This dual construction has the advantage of providing exercise programmes specific to both the Reformer and Cadillac. The effects of exercises on such apparatus are similar to those outlined for the Reformer, meaning that they develop the quality of

muscle contraction in a complex way, from small groups to kinematic chains, and provide increased opportunities to develop suppleness of the body, either in dynamic or static conditions.

EXO Chair

EXO Chair is a chair without back, provided with a split pedal for fixing the legs during exercise. It also has two spring platforms that move up and down in the same time with the help of a stick passing through the two pedals or alternatively. To the bottom part of the apparatus, there are attached, at one side and the other, an elastic band for the work with the upper or lower limbs. Working positions can be seated, lying sideways on the apparatus, standing on the support pedal with one or both feet, etc. Exercises are intended to develop core and lower limb strength, and also stability in the scapular-humeral joint. (John, 2008b)

Ladder Barrel

This is an apparatus made up of a multistep ladder and a surface resembling a barrel. The two components are connected by a sliding base which adjusts the apparatus to the size of each practitioner. The role of the apparatus is to develop the trunk strength and suppleness, and it can be used for different stretching movements or aimed at the muscle and ligament relaxation.

Clara Step Barrel

The apparatus has the shape of a half circle attached to a rectangular trapeze, the upper surface being made up of a very soft and comfortable sponge. The apparatus localises expressly the trunk movement, being designed to develop core strength and spine suppleness in anterior and/or lateral flexion and extension. Due to these benefits, the Barrel is often used in the programmes for people with spine imbalances and even scoliosis. (John, 2008a)

Discussions

Analysing the benefits of using Pilates equipment, we find that exercises are primarily directed towards the qualitative optimization of muscle contraction, with a focus on strength, suppleness and intra- and intermuscular coordination. This is confirmed by specialty literature, which debates about the effectiveness of motor effector and asserts the primordial role of strength in discussing motor abilities, as well as the role of coordination, considered an essential factor that expresses the functioning of the structure, namely the human body. (Cometti, 1996) Here, we should also appreciate its value for suppleness development in all three components: joint, muscle-ligament and neuromotor ones. (Macovei, 1999)

At the same time, exercises using different types of apparatus provide variety and ensure better



action on the movement parameters (accuracy, direction, range of motion, degree of tension and relaxation), in parallel with the development of motor abilities, prevention/correction of physical disabilities, while inducing a general state of wellbeing. Pilates equipment increases the interest in movement, stimulates active and conscious participation, the desire for correct execution and success.

As can be noted from the equipment presentation, beds have a more complex construction that provides much diversity in the working opportunities, while the types of chairs preferably localise body modelling at the trunk muscle level.

Conclusions

In conclusion, we can assert that:

- Analysis of specialized literature reveals a growing interest in the Pilates method, each author trying to promote and develop people's interest in practicing this system of exercises, both with a prophylactic and therapeutic purpose.
- In the practical field, it is found a trend towards increasingly diversified contents, objects and helpful equipment, the purpose of approaches being the development of marketing and the domain as well.
- The benefits of using Pilates equipment are obvious and frame within the general concept of fitness, which associates the physical side with the attributes of mental sphere.
- In the context of the comments presented above, there are confirmed the benefits of the conception promoted by Pilates method, of union between "body and mind".

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