The Journal of Eurasia Sport Sciences & Medicine

J Eurasia Sports Sci Med
http://dergipark.gov.tr/jessm

Volume 1, Issue 1
April 2019, 24-30

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Received: 08.04.2019

Accepted: 01.05.2019

REVİEW

Effects of Pilates Programs among the Elderly on Some Physical Parameters

Abstract

Pilates has recently become one of the most popular sports activities. Many people prefer Pilates to overcome the adverse effects of a sedentary lifestyle. News about celebrities preferring Pilates over other exercise types and increasing number of articles and information on Pilates on societal media also increased people's awareness on it and created hype. Aging decreases physical fitness, and consequently, quality of life. A large number of studies reported that physical activity is a requirement in promoting health and physical well-being of individuals during the aging process. In this literature review, changes in some physical parameters due to practicing Pilates among the elderly were evaluated. The studies in this literature review generally stated that Pilates improves dynamic balance and decreases risk of falling in the elderly. There are also some studies reporting that positive effects of Pilates are not very significant. There is a dearth of scientific research comparing the effects of Pilates to other types of exercising modes.

Keyword: pilates, elderly, women, physical fitness, review.

To cite this article; Bağcı, E. (2019). Effects of Pilates Programs among the Elderly on Some Physical Parameters. J Eurasia Sports Sci Med, 1(1), 24-30.

This article was presented at the 18th International Sports Sciences Congress in Antalya in 2018.

INTRODUCTION and OBJECTIVE

The Industrial Revolution, in addition to a more sedentary life, brought about deterioration in health conditions, and in connection to this, infant mortality and contagious disease (Latey, 2001). Weakened physical functions and unwanted external effects necessitate physical activity in order to have a healthy physical structure and increased quality of life. This situation is much more important among especially the elderly (de Souza, Marcon, de Arruda, Pontes, & de Melo, 2018).

Capability in balance is mainly dependent on the interactions of the visual, vestibular, sensory and motor systems. The process of aging induces physiological changes in these systems, postural stabilization is disrupted, and therefore, the performance in daily life activities also decreases (Matsumura & Ambrose, 2006; Nelson et al., 2007). Especially lumbar pain is one of the most frequently observed problems in the society, and it decreases quality of life (Dagenais, Caro, & Haldeman, 2008; Hoy et al., 2010). Changes related to the aging process, especially those that are related to balance, start to occur about 45 years of age and affect physical characteristics through the sensory system. These changes bring about several problems related to balance by also affecting reaction times (Mesquita, de Carvalho, Freire, Neto, & Zangaro, 2015). Achieving an increase in control over balance by regular exercise is a good strategy to reduce the risk of falling in this population (Granacher, Gollhofer, Hortobagyi, Kressig, & Muehlbauer, 2013; Mokhtari, Nezakatalhossaini, & Esfarjani, 2013).

Pilates is a method that was developed by Joseph H. Pilates for improving the form of the body. Joseph Pilates started to develop this method during WWI and continued to improve it through the 50-year period until his death in 1967. Pilates contains more than 500 flexibility and strength exercises that aim to improve the form of the body. These exercises are mainly divided into two groups as mat (exercise mat) exercises and exercises with equipment (Muscolino & Cipriani, 2004). While mat exercises may be done using or not using apparatuses (elastic bands, mini-balls, etc.), tools that are used in Pilates are equipment which specific designs that may be adjusted for difficulty with different spring resistance values and fit different body positions (Wells, Kolt, & Bialocerkowski, 2012).

Although Joseph Pilates created this method in relation to body form, he named it "the Art of Contrology". Joseph Pilates argued that the Pilates method is not only a method that is practiced for the body, but it is also a technique that is practiced for the form and strength balance of the mind. With this comprehensive method involving flexibility and strength exercises, Joseph Pilates aimed to achieve a strong and flexible body, as well as a mind that is also strong and able to control this body (Muscolino & Cipriani, 2004).

There are six main principles in the Pilates method. These are centering, concentration, control, precision, breath and flow.

1. Centering is the main point of focus for the Pilates method. The "center" is the core part of the body that is also usually known as the "powerhouse".

2. Concentration is important as the mind is the body's guide. There is no unimportant part in the body, and the person should concentrate well on what they are doing.

3. Control refers to controlling the performance of an exercise while applying it by focusing from the center. While doing an exercise, the position, angle and movements of all parts of the body should be kept under control while applying an exercise.

4. All exercises in the Pilates method were made precise by Joseph Pilates. Thus, the main question in the practice is not "how many" but "how to".

5. Exercise should be carried out by rhythmic breathing for achieving the circulation of oxygen to all tissues of the body via the blood.

6. A smoot flow from one exercise to another should be achieved while applying the Pilates method (Latey, 2001).

Centering may be the most important principle of the Pilates method. Pilates believed in the necessity of gaining flexibility and strength in the muscles of the body, and he paid the highest importance to the muscles found at the center of the body (Muscolino & Cipriani, 2004). As opposed to the case of classical resistance exercises, Pilates exercises have an approach that requires the simultaneous activation and coordination of multiple muscle groups (Sofianidis, Dimitriou, & Hatzitaki, 2017).

Pilates is a physical movement system and type of exercise that has become popular worldwide and is used for rehabilitation and improvement of physical fitness (Wells et al., 2012). It is commonly used not only by dancers and athletes but also by all individuals with some modifications for rehabilitation and physical fitness purposes (Barbosa et al., 2017; Latey, 2001). Several studies have shown that Pilates is a type of exercise that involves the combination of muscular strength and increased flexibility, integrates different parts of the body by a specific respiration model and includes exercises that optimize the neuromotor control of the body especially by making deeper muscles work (Mokhtari et al., 2013; Wells et al., 2012).

Joseph Pilates developed this type of exercise by inspiration from the movement style and philosophy of gymnastics and branches such as martial arts, yoga and dance (Latey, 2001). Today, it is possible to encounter several techniques in the world of Pilates. While some of these are techniques that were developed directly by Joseph Pilates himself, while others were developed later (Muscolino & Cipriani, 2004).

Pilates is among the specific exercise methods that are used to eliminate lumbar pain. It involves exercises that make the core of the body work by facilitating isomeric contraction of deep muscle groups (Miyamoto et al., 2018). This is why individuals with back pain are recommended to do Pilates (Barbosa et al., 2017; Wells et al., 2012). The repertoire of Pilates mat exercises involves the stabilization and strengthening of the core area, and this has significance for the performance of balance and physical functions in the elderly (Wells et al., 2012). Especially since the early twentieth century, Pilates has been used to perform physical activities that are required for daily life by achieving the strength, flexibility and contraction control of the muscles especially in the lumbar and pelvis regions (Granacher et al., 2013; Wells et al., 2012). While the effects of Pilates on lumbar pain are researched, another topic of research is whether or not it has a different effect in comparison to other exercise methods. In patients with chronic lumbar pain, Pilates is more effective than a minimal intervention on pain and injury with medium-level effects in the short-run and small effects in the mid-run, but it does not have any difference in comparison to other types of exercise. Moreover, there is still no evidence on the effectiveness of Pilates in the long-run or the optimal dose of treatment (Miyamoto et al., 2018).

Pilates is one of the types of exercise that are used to improve physical fitness. It is used alongside other branches of sports for especially solving problems that are brought by

aging. The purpose of this study is to present the positive and negative effects of Pilates by reviewing studies that investigated the physical changes created by Pilates on the elderly.

METHOD

This article is a literature review, and it was written by reviewing articles that investigated the effects of Pilates on the physical problems that occur by aging and were published in the database of "Web of Science".

CONCLUSION

Muscolino and Cipriani (2004) investigated the effects of Pilates on the core part of the body (powerhouse). Accordingly, significant effects of Pilates on the core region were emphasized regarding the pelvic muscle system and posture. Theoretically, if a person has a perfectly healthy pelvis, they do not need to change this with Pilates or other types of exercise. However, in an average individual, the perfect structure of the pelvis is affected by especially the continuation of the aging process and gravity (anterior tilt). This case leads to lordosis development in the lumbar vertebrae. This is why the structure of the pelvis is highly prioritized in the Pilates method. Another significant effect of Pilates is the extension of the spine. This extension allows the person to stand taller and reduce the pressure between vertebrae. The trainer checks whether the person who will apply the exercise has extended their spine at every Pilates exercise. The third main impact of Pilates is its ability to affect the structural integrity or tonus of the abdominopelvic cavity (Muscolino & Cipriani, 2004).

Yamato et al. (2015) conducted a study on the effects of Pilates on individuals with chronic lumbar pain. They observed that Pilates exercises had a medium-level effect in the short-run and a small effect in the mid-run on eliminating chronic lumbar pains (Yamato et al., 2015). Another study followed the lumbar pain of groups that had one, two or three sessions of Pilates per week, and the results of the group that had two sessions a week were found to be better than those of the group that had one session a week. The two-session and three-session groups had similar results (Miyamoto et al., 2018).

Bullo et al. (2015) reported that Pilates exercises provided significant improvements in the development of the muscles in the lower extremities, dynamic balance and gait mechanics. The same study also stated the positive effects of Pilates on static balance and flexibility (Bullo et al., 2015).

A static and dynamic balance characteristic has a crucial significance in daily life for the elderly. Loss of balance may lead to falling and accidents among elderly people. Sofianidis et al. (2017) reported that elderly people who took part in the sport of Pilates for 12 weeks experienced improvements in their static and dynamic balance skills (Sofianidis et al., 2017). Barker et al. (2015) also stated that Pilates had positive effects on static and dynamic balance in the elderly (Barker, Bird, & Talevski, 2015).

Although several studies reported that Pilates mat exercises provided improvements in some physical parameters in the elderly, there are some debates in a few studies on whether or not Pilates exercises lead to improvements, for example, in balancing skills (Bird, Hill, & Fell, 2012; Gabizon, Press, Volkov, & Melzer, 2016; Mesquita et al., 2015; Vieira et al., 2017). Its effects on other physical functions such as flexibility and the cardiovascular system are not yet clear (Gabizon et al., 2016).

De Souza et al. (2018) reviewed studies on Pilates. In their review, they reported that, in the elderly, Pilates had a positive effect on dynamic balance, muscle strength (lower extremities), flexibility (hips and lumbar region) and cardiovascular durability. In the same study, they reached the conclusion that static balance did not improve by Pilates. They stated three reasons that may have led to such a conclusion. Accordingly, first of all, static balance might not be affected in healthy elderly people. Second of all, the Pilates program that was applied might not have been organized in a way to improve static balance, and finally, there is a possibility that the tests that measured static balance were not able to detect sensitive changes (de Souza et al., 2018).

Millner et al. (2016) investigated the effects of types of exercise on patients of Ankylosing Spondylitis (inflammation in the joints in the lumbar region). They stated that Tai Chi, swimming and Pilates exercises may be useful for individuals with this problem in terms of their contents on motion directionality, functional training and strength (Millner et al., 2016).

Uluğ et al. (2018) investigated the effects of Pilates and yoga exercises on individuals with chronic neck pain. While they found similar results between the yoga and Pilates groups regarding their levels of neck pain, there was thickening in the semispinalis capitis muscle in the Pilates group (Uluğ, Yilmaz, Kara, & Ozcakar, 2018).

Although there are several studies that showed the positive effects of Pilates in the short- and mid-run, it was observed that it was not different to other types of exercises. Moreover, there is still no evidence on the effectiveness of Pilates in the long-run or the optimal dose of treatment (Miyamoto et al., 2018). This reminds one the following. Pilates is a type of exercise, sports. Considering the necessity of taking part in physical activities throughout life for increasing quality of life, Pilates should be considered not as a healing phenomenon but as an exercise, a branch of sports that should be practices life-long.

Mesquita et al. (2015) examined the effects of Pilates and PNF exercises on balance parameters in elderly women. They found that, in comparison to the control group, both methods provided positive effects on balance parameters, while they found no significant difference between these two methods (Mesquita et al., 2015).

Several studies have reported that Pilates leads to improvements especially in the muscle groups in the lumbar regions, and thus, it is useful in general regarding static and dynamic balance and lumbar pains. Though just a few, some studies stated that there is no strong evidence on the effects of Pilates on elimination of lumbar pain yet (Yamato et al., 2015). On the other hand, the first question that comes to mind here is about which Pilates exercises or materials were used in these studies. Wells et al. (2012) reviewed studies on Pilates and found that 38% (120 studies) used mat exercises and some equipment, 25% did not specify an exercise or equipment, and the remaining studies did not provide any recommendation about mat exercises or equipment usage (Wells et al., 2012). Another issue is that, practicing Pilates, especially practicing it with equipment, has high costs (Yamato et al., 2015). This issue led us to think that there have been no particular standards in previous studies on the topic. Especially in studies carried out about Pilates, attention should be paid to include the exercises and materials that are used.

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