Pilates Practice for Improving Contemporary Dancers' Technique

Comprehensive Teacher Training Program
BASI Pilates ®

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Abstract

A professional dancer is a ‘performing athlete’. An athlete whose training must be supplemented by systematic enhancement of the physiological skills required to support their competency. The present work explores the effects of the Pilates method on a professional contemporary dancer’s body, technique and performance. Using the case study of a thirty-three year old female dancer, it is suggested that the Pilates method can be effectively tailored to optimize muscle strength, muscle endurance, flexibility and core stability. These attributes can work synergistically to improve their overall technique and ultimately allow the contemporary dancer to unleash their artistic expression.

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Introduction

The similarities between a professional dancer and an athlete might be more than what meets the eye. Similar to an athlete, the training of a professional dancer must be supplemented by systematic enhancement of the physiological skills required to support their performance, including muscular strength, flexibility and cardiovascular endurance. (Chatfield et al. 1990; Koutedakis and Jamurtas, 2004).

The current momentum of dance, as a discipline, has become centered on the contemporary dance technique, which takes in a diverse range of movement methods and is inspired by concurrent elements of life.

While previous research has examined the effects of physical fitness reinforcement on dance performance (Angioi, 2010), evidence regarding the specific importance of supplementary physical training in contemporary dance performance is still lacking.

The present work examines the effects of the well-known Pilates method as a supplementary training to the contemporary dance technique and performance. It is based on a case study of a thirty three-year old female professional contemporary dancer engaged in one-on-one Pilates sessions during a three-month period.

Theoretical Background

Contemporary Dance

Contemporary dance is a performance art born in the 20th century as a breakaway from the rigid constraints of classical ballet (Angioi et al., 2009). It is a collaborative movement style arising from the combination of ballet and modern dance. Even though there are no specific rules that one has to follow, contemporary dance heavily relies on both ballet and modern dance techniques. Specifically, Bassett (1998) describes contemporary dance as a genre that includes the techniques of modern dancers such as Martha Graham and Rudolf Von Laban, the developments of the modern dance, Post-modernism (Merce Cunningham, Jose Limon, Release Technique), Avant-garde and the New Dance.

Contemporary dance methods are much grounded methods, visibly opposing the graceful, airborne movements of ballet. *Graham* is distinguished by floor work and the use of pelvic and abdominal contractions, *Cunningham* promotes clarity of form and coordination of torso and legwork, whereas *Release* emphasizes on the minimization of tension in the search for fluidity. The latter enables current dancers to move in a less structured way, easily and efficiently, in and out of the floor. In such a progressive technique, a dancer works in relation to gravity with movements that tend to have a continual, articulated flow of release through the muscles and joints of the body. (Buday, 2006)

During the last twenty years, a new generation of artists arose, tapping into a diverse range of movement methods and forming a new fusion of dance. Today's contemporary dance is an eclectic mixture of styles characterized by broken lines, nonlinear movements, acrobatic floor work and the influence of everyday elements of life.

The contemporary dancer

A dancer is perceived as a mutable body-in-flux. In the contemporary dance world, every dancer seeks their own ‘moving identity’ projecting a personal and independent ‘way of moving’. Such a ‘way of moving’ is an accumulation of various factors including training approach, choreographic work and anatomical structure. (Roche, 2011)

A dancer’s performance depends on a large number of technical, physiological, nutritional, psychological, socioeconomic and environmental inputs. At a professional level, dancers must stand out in terms of the aesthetic and technical side of the art, be psychologically prepared to handle the stress of critical situations (e.g. auditions, performances) and most importantly be free from injury; they must be physically ‘fit’ (Koutedakis and Sharp, 1999).

The physical demands placed on dancers from current choreography and performance presentations make their physiology and fitness just as important as skill development (Koutedakis and Jamurtas, 2004; Angioi et al., 2009). It has been suggested that the overall fitness of the individual dancer determines eventual performance (Koutedakis and Jamurtas, 2004).

In particular, muscular power, strength and endurance are extremely important for contemporary dancers. Upper body muscular strength and endurance is needed during transitional movements throughout the floor and partner work (lifting and supporting other dancers). Lower body muscular power, especially in the knees, ankles, quadriceps and hamstrings, is required during explosive movements, such as jumps and high elevation (Wyon et al. 2011). Physiological elements such as range of motion (ROM), especially in the hip joint area, are considered of high importance (Deighan, 2005). Sufficient levels of flexibility and ROM are core elements in dance for optimizing versatility of movement, including extreme joint positions for both ballet and contemporary dancers (Abraham et al., 2016).

A professional dancer is perceived as a ‘performing athlete’ and as athletes get injured, dancers get injured too (Koutedakis and Jamurtas, 2004). According to many field experts (Sohl and Bowling, 1990; Deighan, 2005; Russell, 2013), overwork, unsuitable floors, difficult choreography, insufficient warm-up, fatigue and reduced range of motion are regular factors that contribute to dancer injuries. Poor physical fitness, particularly strength, has also been recently added to this list. An investigation of dancers’ thigh-strength in relation to lower-extremity injuries specified that the lower the thigh-strength levels, the greater the degree of injury (Koutedakis et al. 1997). In addition, the period of recovery from an injury is prolonged in dancers with reduced muscular strength, as joints surrounded by weaker soft tissue are subject to more strain (Weiss and Zlatkowski, 1996). Last but not least, the lower back has been proved to be one of the most injured areas, which together with pelvis, legs, knees and feet, accounts for more than 90% of dance injuries (Askling et al., 2002; Koutedakis et al., 1997).

Similar to sport, dance performance is not a single action. It is a complex and aesthetic ‘exhibit’ depending on a large number of aspects, such as the control of movement, spatial skills, accuracy of movement; technique, dynamics, timing, rhythmical accuracy and physical qualities (Angioi et al., 2009).

Complementary training

Dance utilizes the human body as its instrument of expression. Dance training, however, is not sufficient enough to appropriately condition the musculoskeletal system and for this reason, researchers suggest that the art of dance requires support from enhanced physiological capabilities such as muscular strength, power, flexibility and cardiovascular endurance (Chatfield et al. 1990; Koutedakis and Jamurtas, 2004).

Dance has attracted little scientific interest with regards to the effects of physical fitness improvements on performance and injury severity (Angioi, 2010). This may be due to the fact that fitness training has only recently started to be considered as a complementary activity in the context of professional dancing, mainly because of the stereotype that dancers are artists and do not follow the athletes' steps in terms of physical preparation (Krasnow and Kabbani 1999). Yet, dancers are engaged in long hours of daily training, followed by rehearsals and heavy performance schedules (Shah et al., 2008).

Even though research in this field may be minimal, preliminary data have indicated that supplementary off-studio training can increase key fitness-related parameters, hence benefit aspects of contemporary dance performance and reduce the incidence of dance-related injuries (Koutedakis and Jamurtas, 2004; Brown et al., 2007; Angioi, 2010). Specific studies that investigated supplementary strength training effects on dancers revealed that a significant increase in muscular strength resulted in significant benefits in enhancing aesthetic jump performance and overall aesthetic competence and dance technique (Koutedakis et al., 2007). In addition, 'improvements in aerobic / anaerobic capacities and muscular strength have been previously linked to better oxygen transport facilities and enhanced neuromuscular function, which in turn, affect qualitative elements of physical performance through reduced fatigue and injury rates.' (Angioi et al., 2009:483)

Pilates and Dance

Pilates Technique takes its name from Joseph Pilates. Back in the 1920's a German-born man, émigré to America, devised the Pilates method as a new approach to exercise and body-conditioning. The method was designed for men and women and addressed the body as a whole. Nowadays, Pilates has grown to be one of the most well-known fitness systems worldwide and reflects upon a body conditioning technique that develops body awareness and improves postural alignment, muscular strength, balance, flexibility and efficiency of movement.

Historically, Pilates founded his first 'Contrology' studio in New York in 1926. The studio was sharing the same building as the New York City Ballet so it soon became very popular particularly within the dance community. Dance legends such as Martha Graham, George Balanchine, Ruth St Denis and Ted Shawn, all worked with Joseph Pilates to achieve technique improvements and accelerate recovery from injury. (Pilatesfoundation.com, 2020)

Beyond this historical connection, dancers relate to Pilates due to a sense of familiarity. Pilates has principles remarkably close to several dance styles and uses movements very similar to certain dance technical skills. Dancers are only able to optimally perform their art when they are sufficiently strong and flexible and Pilates develops capacities crucial for performance without neglecting artistic competency. By emphasizing breathing, postural alignment and abdominal work, Pilates is able to support the dancer in the development of their optimum dance technique (Amorim and Wyon, 2014). During a Pilates class, the continuous engagement of abdominals, hip flexors and gluteus muscles leads to the development of a stronger core and to an increased ability to hold and control positions for longer periods of time (Amorim and Wyon, 2014). Other noticeable changes on a dancer's body following Pilates training include an increase in muscular strength and range of motion, corrected misalignments, better pelvic placement, clarity in movement patterns and improved spinal extension (Bergeron, 2018).

The Purpose

The design of a Pilates training session, including its duration and exercise repertoire, should be directly adapted to the dancer's objectives. What does the dancer want to achieve by taking Pilates classes? Is there a specific objective of improving flexibility? Does the dancer want to re-examine movement patterns? Is the training aimed to facilitate overall fitness? Or is it just used for rehabilitation?

A Pilates training plan should always be developed according to the student's objectives, whether the student is a dancer or not. The teacher must create an evolving, focused, well-thought plan that will help the student to accomplish their individual goals.

BASI Block System

Body Arts and Science International (BASI) is an internationally renowned Pilates education organization established in 1989 by Pilates Educator, Rael Isacowitz. The organization preserves the classical repertoire and the essence of Joseph Pilate's vision and philosophy while supporting evolution based on experience and scientific knowledge.

The BASI Block System is a 'filing' system categorizing all exercises that Pilates repertoire consists. Within a flexible framework, the system organizes the Pilates exercises in a logical sequence that ensures progressive structured classes and physical, mental and spiritual well- being. (Isacowitz and Clippinger, 2020; basipilates.com, 2020)

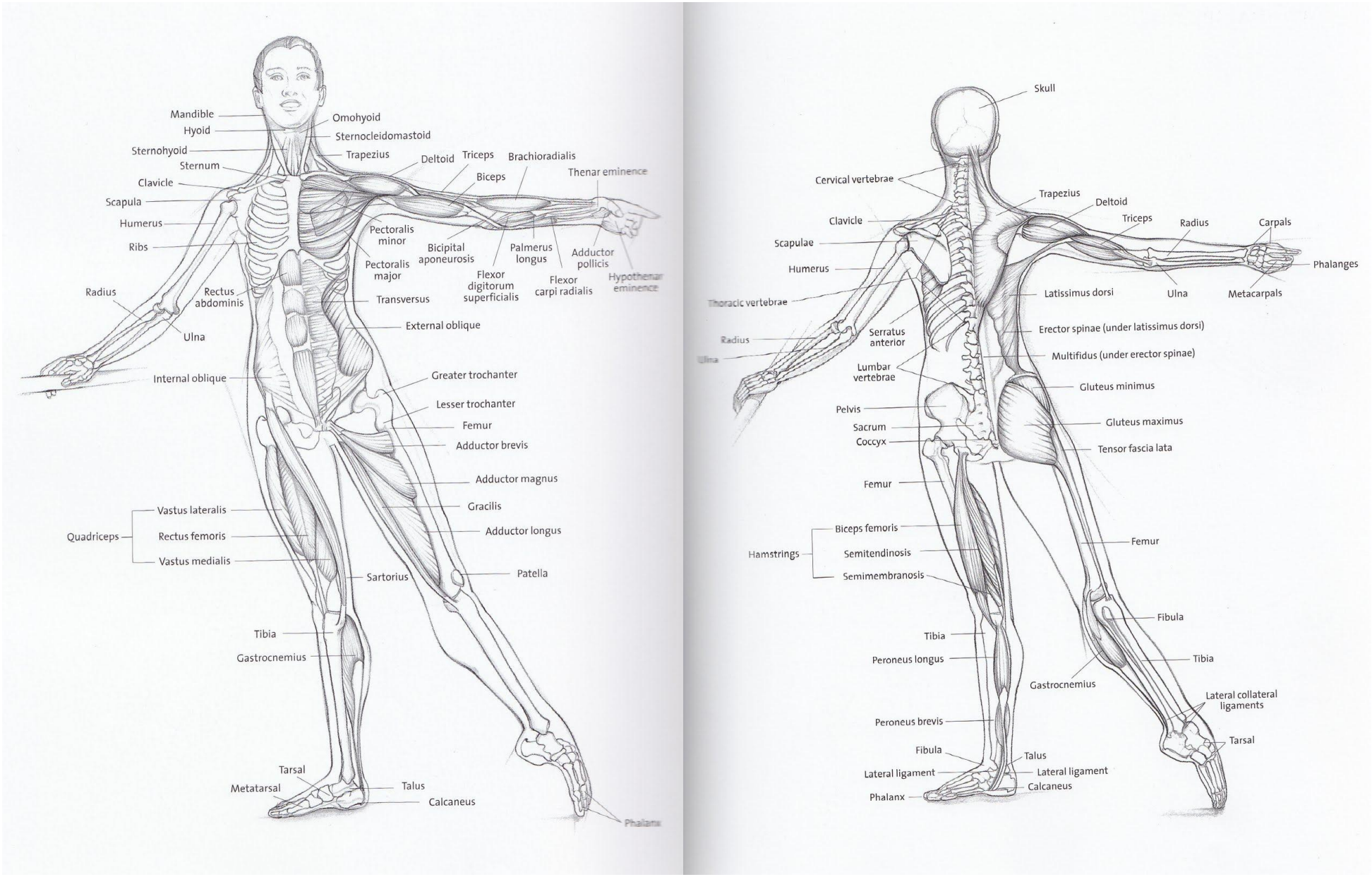

Figure 1. Anterior and posterior views of a dancer's anatomy.

(Adapted from https://images.app.goo.gl/hmuPo9CBu4AofhrQ9 and https://images.app.goo.gl/o2UyaJqQTibevKvNA)

Case Study

Name: Zoe

Age: 33

Gender: Female

Background: Zoe is an active contemporary dancer and choreographer since 2008. She started dancing ballet at the age of 13 and pursued her studies in ballet and contemporary dance in professional dance schools in Greece and Belgium. Zoe has some experience on the Pilates method by periodically participating in mat work classes. During her professional career she has not had any severe injury. She is a physically 'fit' dancer aiming to practice Pilates in order to improve her overall fitness level. Specific body areas that she would like to work on during her Pilates training include the hips and the upper body.

Objectives

1. Powerhouse strengthening.
2. Hip joint flexibility and range of motion amelioration.
3. Increases in upper body muscular strength and endurance.
4. Spinal mobility improvement (articulation, rotation and flexibility).

Muscle focus

The Powehouse

The Powerhouse refers to the center of the body - the core - creating the foundation for all movement. Joseph Pilates has put significant emphasis on strengthening the Powerhouse as an effective way to achieve core-stability. Attention to core stability and strength is considered foundational to the remainder of a dancer's training as optimal function of both the core and extremities is needed (Russell, 2013). Core stability particularly refers to the neuromuscular control that will allow a person to keep the pelvis and spine in the desired position, while moving the whole body without unintended distortions or compensations.

Core muscles start at the bottom of the ribs down to the top of the hip and all the way to the bottom of the pelvis. Significant muscles of the Powerhouse include abdominals, lower back muscles, hip joint muscles and the pelvic floor. (Muscolino and Cipriani, 2004, Isacowitz and Clippinger, 2020).

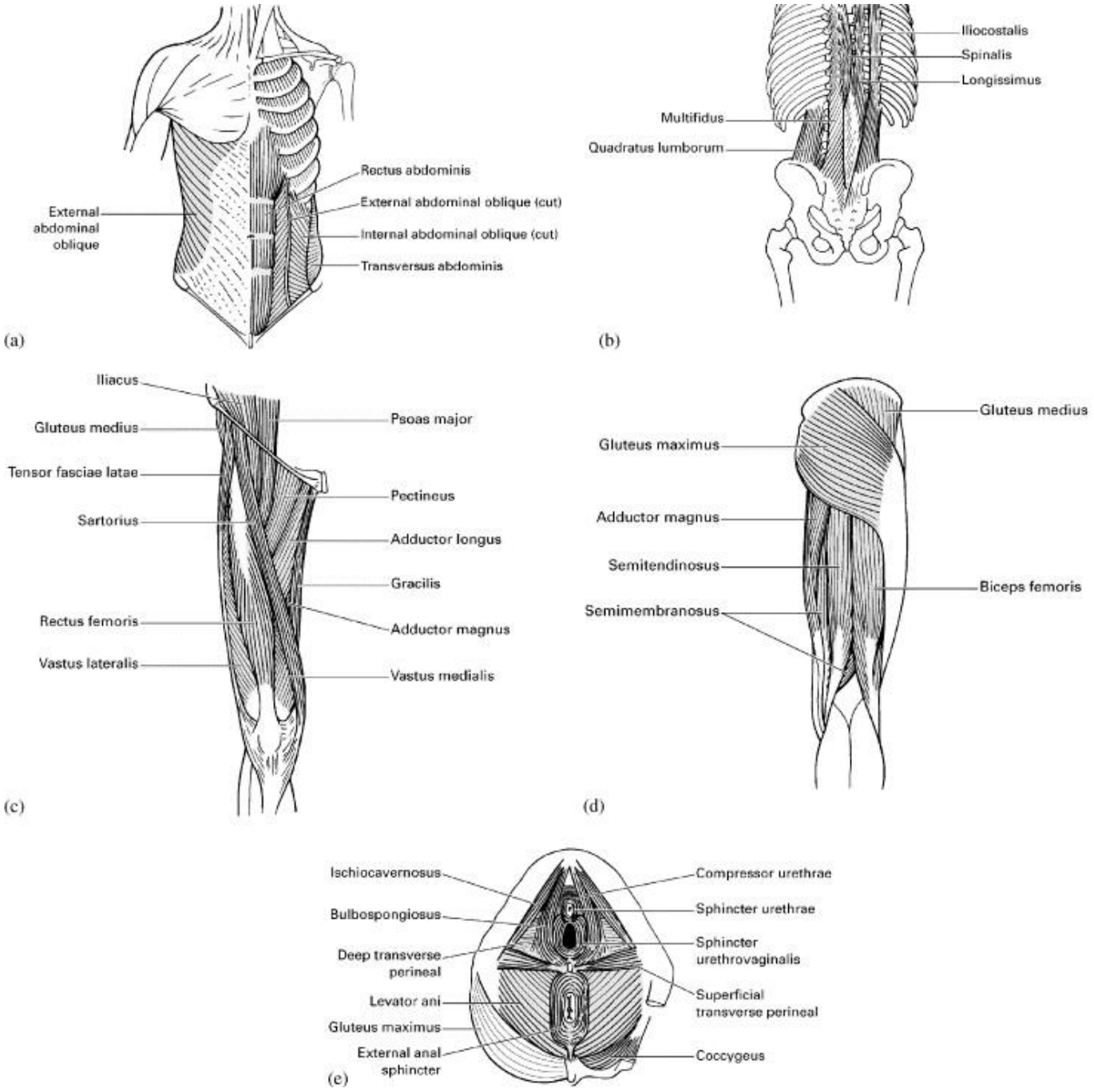

Figure 2. The Powerhouse; a) Abdominals; b) Back muscles; c) Hip joint muscles (anterior); d) Hip joint muscles (posterior); e) Pelvic floor

(Adapted from https://images.app.goo.gl/b2jKoYJUHxDwVHaj8)

Abdominal Muscles

The abdominals have long been appreciated for their potential to enhance movement technique, improve certain postural problems and reduce the risk of certain types of back injuries. The four paired abdominal muscles are: rectus abdominis, external oblique, internal oblique, transverses abdominis. All of the abdominals attach into a tendinous band that runs vertically down the center of the abdomen (linea alba). (Isacowitz and Clippinger, 2020)

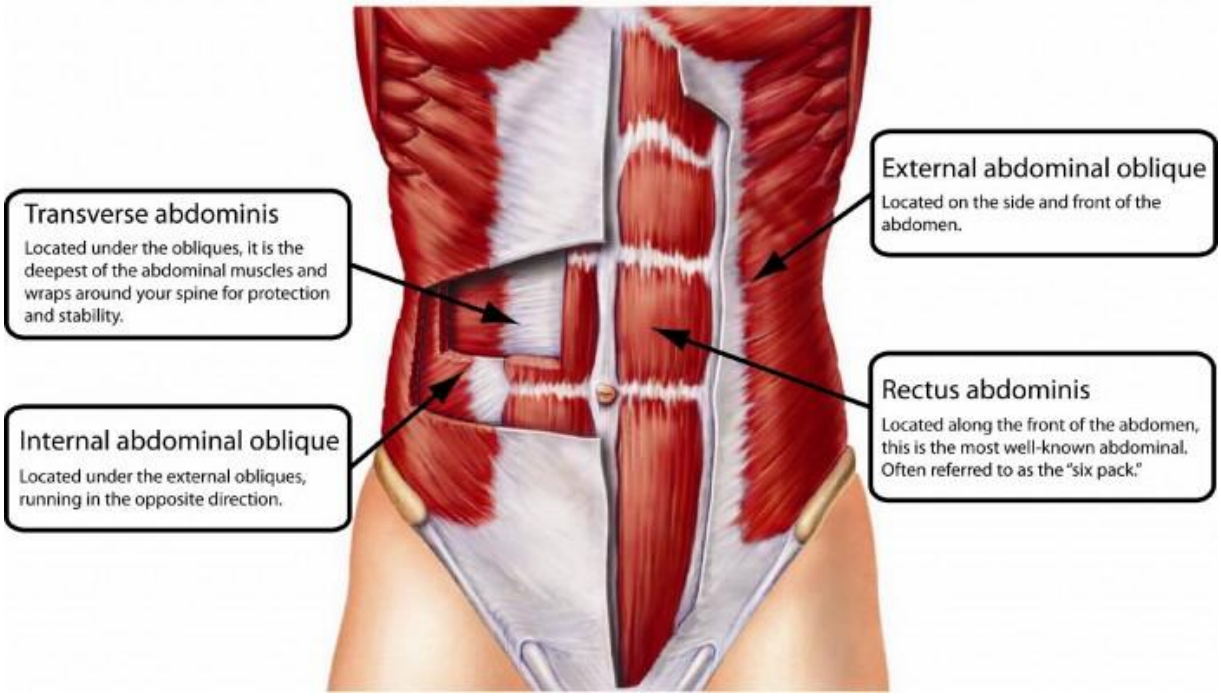

Figure 3. Abdominal muscles of the core (anterior view)

(Adapted from http://www.balancemyworld.co.uk/wp-content/uploads/2016/01/abs1.jpg)

Upper body muscles

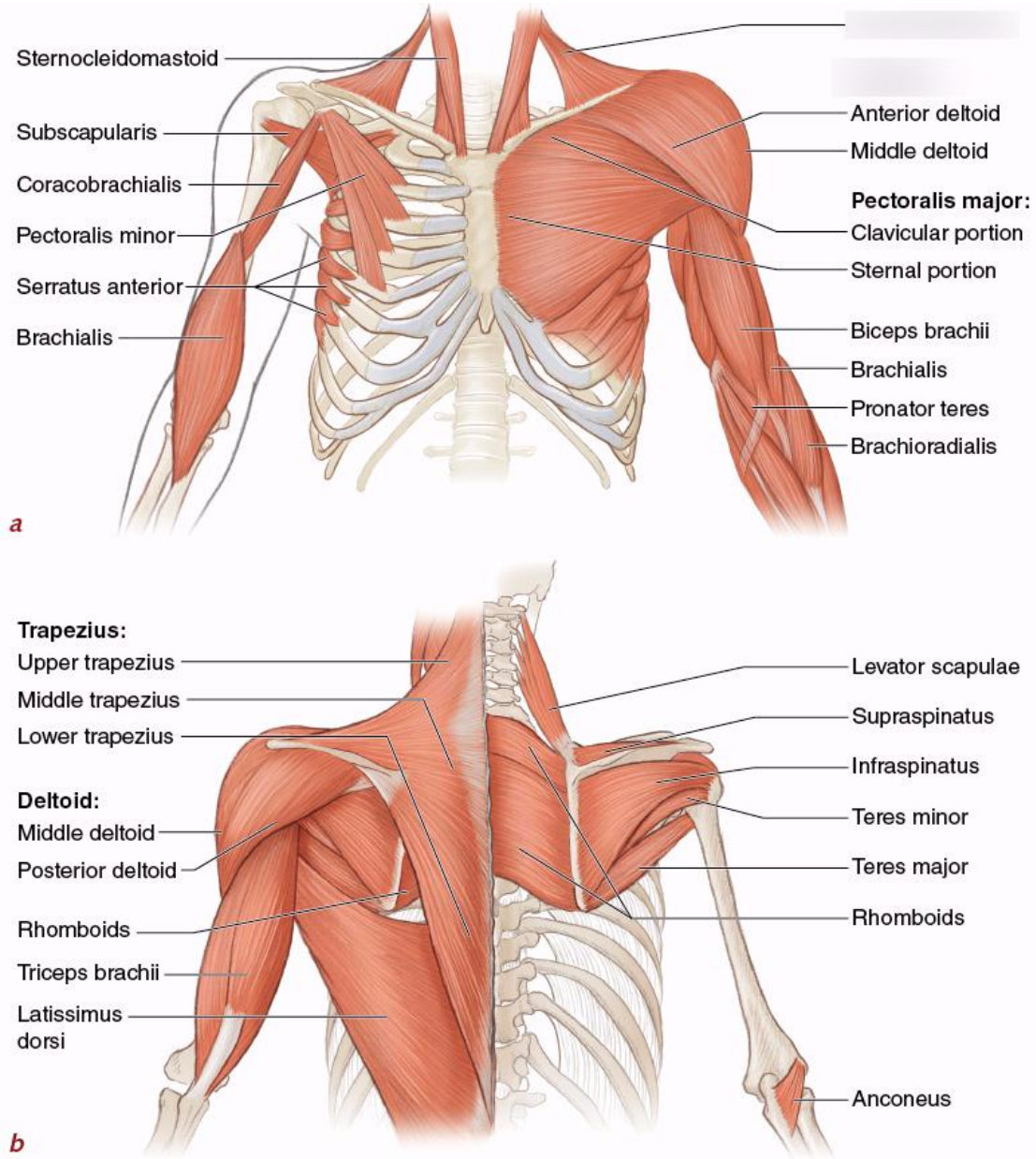

Figure 4. Upper body muscles; a) Anterior view; b) Posterior view. Deeper muscles are shown on the right side of the body.

(Adapted from https://images.app.goo.gl/PbrhHymCGLtpKbdY6)

Conditioning Program using the BASI Block System

A 12-week training program was planned according to the BASI Block System. Over a three month period, the student (Zoe) took private equipment Pilates classes twice a week. The equipment used for the classes was BASI Systems.

Table 1. Week 1-6 of Pilates training. (SL = Spring Load, R= Repetitions)

Block	Equipment	Exercises	Notes
Warm up	**Mat**	Pelvic curl Spine twist supine Chest lift Chest lift with rotation	Fundamental warm-up to awaken the spine, abdominals and hamstring muscles.
Footwork	**Reformer** SL: Double leg exercises (3 Red, 1 Blue) Single leg exercises (3 Red) R: 10 on each exercise	Parallel Heels Parallel Toes V Position Toes Open V Heels Open V Toes Calf Raises Prances Single Leg Toes	Focusing on pelvis stabilization while strengthening quadriceps and hamstring muscles.

Abdominal Work	**Reformer** R:6 on each exercise	Short Box Series: · Round Back · Flat Back · Tilt · Twist · Round About · Climb-a-Tree	Powerhouse activation and toning. Specifically, aiming to improve spinal mobility and core stability while strengthening abdominal and back extensor muscles.
Hip Work	**Reformer** SL: 1 Red, 1 Blue R: 10 on each exercise	Frog Circles (up,down) Extended Frog Extended Frog Reverse	Improving hip joints' range of motion by strengthening and stretching muscles such as adductors and hamstrings. Also focusing on pelvis stabilization by the effort of maintaining a neutral pelvis.
Spinal Articulation	**Reformer** SL: Bottom Lift (2 Red) Short Spine (1 Red, 1 Blue) R: 5 on each exercise * Spinal articulation exercises were added on the 11th session.	Bottom Lift Short Spine	Spinal articulation and abdominal work. Also strengthening and stretching hamstring muscles.
Stretches	**Reformer** SL: 1 Red	Kneeling Lunge	Iliopsoas and hamstring muscles stretch. Holding each position for several seconds. (3 breaths)

Full Body Integration 1 (FBI)	**Reformer** SL: 1 Red, 1 Blue R: 5 on each exercise * FBI 1 exercises were added on the 11th session.	Scooter Up Stretch 1 Up Stretch 2	Focusing on hip dissociation as well as core and shoulder control and stability. Strengthening back and abdominal muscles as well as gluteus muscles.
Arm Work	**Cadillac** R:10 on each exercise	Arms Standing Series: · Chest Expansion · Hug-a-Tree · Circles (up,down) · Punches · Biceps	Significant standing work for the upper body. Strengthening upper body muscles (latissimus dorsi, pectoralis major, shoulder extensors, triceps and biceps) while holding a stable standing position (spinal and pelvis stabilization).
FBI 2	**-**	**-**	**-**
Leg Work	**Reformer** SL:1 Red, 1 Blue R:10 on each exercise	Jumping Series: · Parallel Position · V Position · Single Leg Parallel · Leg Changes	Empowering quadriceps, adductors and plantar muscles of the foot while trying to hold a stable pelvis.
Lateral Flexion/Rotation	**Reformer** SL:1 Red R:5 on each side	Mermaid	Improving spinal mobility and shoulder stability while empowering oblique, latissimus dorsi and deltoid muscles.
Back Extension	**Reformer** SL:1 Blue R: 5 on each side	Pulling Straps 1 Pulling Straps 2	Back and shoulder extension muscle work while holding an active body (abdominals, gluteus, hamstrings).

Table 2. Week 6-12 of Pilates training. (SL = Spring Load, R= Repetitions)

Block	Equipment	Exercises	Notes
Warm up	**Mat**	Roll Up Spine twist supine Double Leg Stretch Single Leg Stretch Criss Cross	Moderate warm-up with an emphasis on spinal articulation and abdominal muscles empowerment.
Footwork	**Wunda Chair** SL: 3 - 3 R: 10 per exercise	Parallel Heels Parallel Toes V Position Toes Open V Heels Open V Toes Calf Raises Single Leg Heels Single Leg Toes	Focusing on core contraction and stabilization while strengthening quadriceps and hamstring muscles.
Abdominal Work	**Wunda Chair** SL: 0 - 3 R: 5 per exercise	Cat Stretch Kneeling Torso Press Sit	Powerhouse strengthening with a focus on abdominal and back muscles. Necessary shoulder blade stability and hip muscles control.

Hip Work	**Cadillac** SL: Yellow R:10 per exercise	Single Leg Side Series: · Changes · Scissors · Circles (forward,back)	Significant hip strengthening single leg exercise in a turn-out position. Strengthening hip muscles while using the core to hold a stable neutral pelvis.
Spinal Articulation	**Cadillac** R: 3 per exercise	Monkey Original Tower	Improving spinal mobility and articulation while stretching hamstring muscles.
Stretches	**Auxiliary (Pole)** R: 8 per exercise	Shoulder Stretch Overhead Stretch Side Stretch Spine Twist	Upper body stretches with a pole and a Pilates ball. These exercises are offering back and shoulder stretching while at the same time the student has to focus in maintaining a stable core and pelvis on the Pilates ball.
FBI 1	**Cadillac** R:6 on each exercise	Thigh Stretch with Roll up Bar Saw	The thigh stretch exercise offers to the dancer a stretch to the thigh and psoas, while actively working on the abdominals. 'Saw' focuses on a hamstring stretch while maintaining torso muscles active.

Arm Work	**Reformer** SL: 1 Blue, 1 Red (Biceps only) R:10 per exercise	Arms Kneeling Series: · Chest Expansion · Circles (up,down) · Triceps · Biceps	A challenging kneeling arm series that focuses on empowering arm and upper back muscles while working on core stability. Muscle focus: Latissimus dorsi, deltoids, pectoralis muscles, triceps and biceps.
FBI 2	**Reformer** SL: 1 Red R: 5 per exercise * FBI 2 exercises were added on the 20th session.	Balance Control Front Balance Control Back Prep	Advanced full body integration exercises with a focal point on core strengthening and stabilization.
Leg Work	**Wunda Chair** SL: Leg Press Standing (0-3) Frog Front (3-3) R: 10 per side and exercise	Leg Press Standing Frog Front	Standing exercises are crucial for core stability and balance. Strong gluteus muscles are necessary for both stability and great balance.
Lateral Flexion/Rotation	**Wunda Chair** Springs: 3 - 3 R:5 per side	Side Pike (3-3)	Improving spinal rotation and shoulder stability while empowering oblique and deltoid muscles.

Back Extension	**Cadillac** R:3 per exercise	Hanging Back	Empowering back extensor muscles while controlling the whole body so as to efficiently execute the exercise. (Spinal articulation, thoracic extension, active lower body)

Discussion

‘Consistent practice is essential for reaping the rewards of Pilates’ (Isacowitz and Clippinger, 2020:245).

Zoe proved to be a consistent student that embraced the Pilates method and harvested its benefits during her three-month training period.

Zoe’s objectives were:

1. Powerhouse strengthening.
2. Hip joint flexibility and range of motion amelioration.
3. Increase in upper body muscular strength and endurance.
4. Spinal mobility improvement (articulation, rotation and flexibility).

In line with her objectives, Zoe observed several changes to her body, as revealed through her dance training and performance.

In particular, Zoe experienced higher jumps and a feeling of having stronger legs along with a lighter torso. This was mainly due to the Powerhouse strengthening, basic foot work and additional leg work. She also reported easier weight shifts throughout her floor work routine and she could finally perform some of the acrobatic movements that she previously found very difficult. She particularly told me “I felt that I could trust my arms more”. Spinal articulation was also improved, as she felt she could do more versatile and articulated movements. In addition, she observed additional fluidity enriching her individual dancing identity. Still, Zoe expressed that even though she worked on hip flexibility, she did not feel any big difference around that area.

According to my observation, Zoe did successfully work on all four objectives. Firstly, Zoe’s level of strength and endurance, both at the core and upper body, has increased as she could bear more repetitions, hold each position longer and generally needed less breaks between the exercises during our one-hour session. Secondly, even though Zoe was already flexible around the hip joint area, hip work, stretching and leg work exercises were advanced along with a steadier pelvis. The more Zoe understood exercises such as *Extended Frog*, *Single Leg Side Series* and *Auxiliary/Pole Stretches*, the more

she was able to achieve muscle control, flexibility and stability. At the end, Zoe's hips were 'freer'. Furthermore, Zoe has shown great improvement in exercises considering spinal articulation. When Zoe first started her sessions it was evident that spinal mobility and flexibility were limited to a small range, with the student usually expressing a feeling of stiffness around her back. Spinal flexion, extension, lateral flexion and rotation were greatly improved through spinal articulation exercises. Soon after the onset of training, Zoe showed great interest in the *Pelvic Curl* and clearly understood its importance as the foundation of all her training. More advanced exercises such as *Short Spine, Monkey Original* and *Tower* expanded her understanding of the sense of articulation. She particularly claimed that through sufficient cueing, she could sometimes visualize and eventually feel her spine properly moving and articulating.

Overall, by the end of her three-month training period, Zoe could perform all given exercises in a very clear and efficient way for her body.

Conclusion

For an optimal performance, the dancer's aerobic and anaerobic capacities, muscular strength, power and endurance, as well as joint mobility and flexibility, must be at their peak in order to achieve aesthetic and artistic competence (Heyward, 2002, Agioi et al. 2009).

Even though research in this field is minimal, previous writers (Koutedakis and Jamurtas, 2004; Brown et al., 2007; Angioi, 2010) have reported that supplementary off-studio training can increase such key fitness-related parameters and benefit aspects of contemporary dance performance.

This study aimed to specifically examine the gains of Pilates practice as a supplementary training to a professional contemporary dancer's progress. Based on the presented case study of professional dancer Zoe, it is suggested that the Pilates technique can be effectively tailored to a professional contemporary dancer and their specific body. The results support that a three-month period of Pilates practice can provide specific benefits with regards to muscle power, strength, endurance, flexibility, core stability and overall technique improvement.

Suggestions

As both muscular strength and endurance are significant pillars for contemporary dancers, a recommendation for Zoe would be to continue training on the Pilates method having two classes per week. This could be achieved through a program based on muscle endurance (mat work class) and a strength-based program using the Pilates equipment.

In addition, several researchers (Heyward, 2002; Koutedakis and Jamurtas, 2004, Angioi et al., 2009, Isacowitz and Clippinger, 2020) have reported that aerobic capacity is another significant element of physical fitness especially for dancers, where cardiovascular endurance can be proved to be really

helpful in reducing the risk of injury. In order for Zoe to successfully complement her dance training and optimize her performance it is suggested to train on cardiovascular exercises in order to increase the internal body's temperature and achieve heart rate elevation. Such exercises may include brisk walking, running, biking and swimming.

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