Pilates for Runners

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September 6th, 2014
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Abstract

Running is an extremely popular form of exercise that demands a substantial amount of energy as it is one of the most effective forms of burning calories through multiple major muscle group recruitment. Running on all different terrains utilizes almost all the muscles in the body, especially the muscles of the legs such as: the adductors, the quadriceps, gluteals, calves and the hamstrings—not to mention a multitude of stabilizer muscles. In conjunction with the lower body muscles, the abdominals are active when running at all times as well, to help stabilize the pelvis and maintain balance. One must keep in mind though, that due to the large amount of musculoskeletal stress placed on the lower extremities and lumbo-pelvic hip complex in particular, it can quickly highlight any imbalances within the body from its repetitive nature through the gait cycle. Imbalances occur naturally, whether it is from common postural deviations, tight over-used muscles, weak under-used muscles, or structural misalignments, as movement in general entails the complex activation of muscles in a well-timed and coordinated manner (BASI, 2013). That is why it is of the upmost importance for runners to maintain balanced synergistic strength, flexibility, length, and fluidity of their muscles through their full ranges of motion with correct alignment, form, and muscle recruitment to decrease risk of injury or pain. For that reason, the Pilates repertoire, with its emphasis of strengthening through the full range of motion, in addition to stretching (or increased flexibly), poses as an excellent tool for cross-training and/or rehabilitation for all runners alike to help detect undesired movement compensations and correct those imbalances. Also, utilizing an individualized Pilates program designed specifically for the runner’s needs and with the continuous focus on core stability and strengthening, will undoubtedly have a profound effect on the client’s running performance and longevity of the body.
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Anatomical Description

As previously stated running requires a large amount of muscles to be utilized, with a large emphasis placed on the lower extremities and the lumbo-pelvic hip complex. Figure 1 displays the major muscles of the lower body that are active during running. Figure 2 shows the muscles of the lumbo-pelvic hip complex that is comprised of the lumbar spine, pelvic girdle, and hip joint. Figure 3 illustrates the major muscles that make up the “core.” The core is a term used for the description of the musculature of the trunk, particularly those muscles that are fundamental in stabilization (BASI, 2013). That is why it is essential to observe the function of the core when trying to obtain positive running movement patterns and increased performance.

Figure 1:
Figure 2:

(a) Anterior superficial view
(b) Posterior superficial view

Figure 3:
Case Study

Raya Bowden is a 26 year old female athlete with her main sport of choice being endurance running. She typically runs four times a week with distances averaging around six miles each run, not including her weekly long runs. She is now on a training program for her next half marathon and wants to include Pilates into her cross-training regimen to alleviate pain and increase muscular endurance, strength, and flexibility. Raya pointed out that she notices aches and pains on and off in her hip, pubic symphysis, iliotibial band, Sacroiliac joints, hamstrings, knee joints, shoulders, and sometimes arches during runs. Upon postural assessment and plum line observation, Raya exhibited mild hyperlordosis of the lumbar spine and slight over pronation of the feet—the left more so than the right. In addition, her shoulders were slightly rounded into an internal rotation position which indicated tight pectoral muscles. In order to design a program for Raya to increase her strength, flexibility, and running performance, it was important to take into consideration which days she did her long runs in order not to overuse fatigued muscles or cause mental burnout.
Prescribed Repertoire

Raya has a modest amount of experience with Pilates mat work from sporadic group classes at her local gym, and no experience whatsoever on any apparatus. The main goals of her training plan included muscle strengthening (especially weak, underdeveloped), increased hip stabilization and mobility, and muscle stretching to allow muscles to work through their full range of motion. Below is the training program with progressive options within her 4 week timeline.

**Warm-up (Mat Work)**

Option 1: Pelvic Curl, Spine Twist Supine, Chest Lift, Chest Lift with Rotation, Leg Changes
Option 2: Roll up, Double Leg Stretch, Spine Twist Supine, Single Leg Stretch, Criss Cross
Option 3: Incorporate foam rolling of hip flexors and hamstrings especially after run days.

**Foot Work:** (Reformer)

Parallel Hells, Parallel Toes, Small V Toes, Open V Hells, Open V Toes, Calf Raises, Prances.

Option 2: (Single Leg Heel, and Single Leg Toes)

**Abdominal Work:** (Reformer)

Option 1: Hundred Prep, Hundred, and Coordination.

Option 2: Flat Back, Tilt, Twist, Round

**Hip Work:**

Option 1 (Cadillac): Frog, Circles (Down, Up), Walking, Bicycles
Option 2: Single Leg Supine- Frog, Circles, Hip Extension, Bicycle
Option 3 (Reformer): Frog, Extended Frog, Extended Frog Reverse Circles (Down, Up)
Spinal Articulation:
Option 1 (Reformer): Bottom Lift, Bottom lift with Extension
Option 2 (Cadillac): Monkey Original, Tower Prep
Option 3: (Reformer) Short Spine, Long Spine.

Stretches:
Option 1 (Reformer): Standing Lunge Series, Side Split,
(Ladder Barrel) Shoulder Stretch 1, Should Stretch 2
Option 2 (Cadillac): Shoulder Stretch
Option 3 (Reformer): Kneeling Lunge/ progress to Full Lunge.

Full Body Integration:
Option 1 (Reformer): Scooter, Elephant
Option 2 (Reformer): Down Stretch, Stomach Massage Flat Back

Arm Work:
Option 1 (Reformer): Arms Supine Series (Extension, Adduction, Up Circles, Down Circles, Triceps
Option 2 (Reformer): Arms Sitting Series (Chest Expansion, Biceps, Rhomboids, Hug-A-Tree, Salute
Option 3 (Reformer): Arms Kneeling Series (Chest Expansion, Up Circles, Down Circles, Triceps, Biceps

Leg Work:
Option 1 (Reformer): Hamstring Curl
Option 2 (Reformer): Add Single Leg Skating

Lateral Flexion/ Rotation:
Option 1 (Reformer): Mermaid
Option 2 (Wunda Chair): Side Over
**Back Extension:**

Option 1 (Reformer): Breast Stroke Prep  
Option 2 (Ladder Barrel): Swan Prep  
Option 3 (Wunda Chair): Swan Basic  
Option 4 (Reformer): Pulling Straps 1/ to Pulling Straps 2

An option to cool down with Ladder Barrel Stretches for the shoulders, gluteals, hamstrings, adductors, and hip flexors is included as well. In addition to aid her running, Raya will be including the gluteal side lying series and gluteal kneeling box series to her workout routine at least once a week.

**Reasoning and Results**

Due to the fact that Raya was not experienced on the Pilates apparatuses, an initial mat warm up was included to start her routine from a place of breath and body awareness before progressing or moving her comfortably to the apparatuses. The Block System was used to create her program following fundamental to intermediate level exercises from each block to familiarize her with the equipment. Exercise selection was dictated by means to promote stretching of the hip flexors, hamstrings, adductors, and shoulders, and include strengthening of her hip stabilizers and extensors, upper back, abdominals and obliques to improve her overall posture. Many exercises from the repertoire served multiple purposes in Raya’s program. For example, Monkey Original integrates mobility of the ankle joint as well as a hamstring and calf stretch into a full body integration movement. Essentially all of the exercises chosen will benefit Raya as they will be using her body in a different way other than running, and strengthen her muscles in other functional movement patterns.
Raya committed to two Pilates sessions per week for one month to supplement her running schedule. At the end of her first trial month, with eight sessions under her belt, she noticeably released the tension in her hip flexors and lower back, which in turn decreased her anterior pelvic tilt. She was no longer experiencing hip pains, and exhibited a substantial gain in hip stability as well as an openness through the hips. The single leg options for footwork on the reformer, and hip work on the Cadillac, were included for that specific reason—to develop the musculature, balance, and a synergistic stability between each leg which improved alignment and flexibility (Balanced Body, n.d.). Although hip work was included to increase lumbopelvic stability (the area where Raya expressed pain previously to starting the Pilates program), other exercises outside of the hip work block utilized and strengthened her hip stabilizing muscles as well. Shoulder stretches on both the Cadillac and Ladder barrel where also key exercises in her routine that helped with the roundedness, or internal rotation, of her shoulders. In conjunction with the shoulder stretches, the back extension block which included the Rhomboids exercise in the Arms Sitting Series in her program, helped to strengthen her postural muscles significantly and support the spine during running and daily life.
Conclusion

Many injuries and chronic pain are often the result of imbalances, whether it is from strength, flexibility, coordination, movement mechanics, or a combination of all these aspects (BASI, 2013). That is why incorporating Pilates into the client’s running program will help address any of these imbalances, aid in preventing injuries, and improve their performance. In the case study of Raya Bowden, the use of the BASI block system during her Pilates cross-training regimen greatly improved the freedom of the hip joint, as well as the stability, alignment and musculature of the legs, core strength/stability, and back extensor recruitment. The nature of being an endurance running athlete for Raya involves perpetual repetition of particular movement patterns, and Pilates was a great way to bring balance to many levels and aspects of her training and life. In a way it re-educated her body on a neuromuscular level that heightened her performance and decreased the occurrence of her initially stated injuries. Raya may have endeavored to add Pilates as a supplemental physical cross-training component for her running schedule, but encountered the ten guiding principles of the BASI approach, and quickly learned it was a form of mind-body conditioning. The great thing about Raya’s first month of Pilates training was that she openly accepted the ten guiding principles, and let them lead her through tough internal processes and roadblocks towards transformation (mental, physical, and spiritual), that is still ongoing, but it is evident in the way that she carries herself now that the work really helped transcend her to a place of wholeness in all aspects of life. In conclusion, Raya’s case study demonstrates that Pilates is a mind-body experience that helps create balance, strength, flexibility, and improvement in performance for endurance runners or all runners for that matter.
Bibliography


http://www.livestrong.com/article/374003-muscles-used-in-running-vs-cycling/

