

**STUDY UPON THE BENEFITS OF PILATES
EXERCISES IN ANTEPARTUM PERIOD**

By Cristina Stark

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Abstract

Prenatal prophylaxis is a very debatable issue in the world, so it is also a topical issue, the prominent progress in birth rate increase recently recorded in Romania, have been a strong urge to bring the knowledge and principles of physical activity into prenatal period . (Ionescu A., 1969, p. 5)

In the present paper I aim to highlight the benefits of Pilates, personalized and standardized exercises based on subject and individual needs, through enhanced and well-defined prenatal education.

I believe that bringing a child to the world is a difficult phenomenon, but also the most beautiful thing for a woman, and so I want to implement the notion of prenatal prophylaxis in order to create a healthy decade in which women who are preparing to become mums possess a luggage of knowledge about the period that is to change both the body and the life.

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Source: https://www.merckmanuals.com/home/children-s-health-issues/bone-disorders-in-children/kyphosis-21.08.2019	7
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the prenatal and postnatal period, represent the guarantee of a life traveled in the right style and the avoidance of negative effects..... 16

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1. Morpho-functional changes in the body during pregnancy

The morpho-functional changes of the maternal body during pregnancy are the consequence of adapting it to the new requirements created by the presence and the needs of the fetus, causing it a special physiological state. From the point of view of kinetoprohylaxis, in the case of physiological changes during pregnancy, only symptoms that are not pathologically relevant and which can be influenced by exercise are to be considered. (<http://www.creeaza.com/familie/medicina/Modificari-morfofunctionale-al171.php> - 27.07.2019)

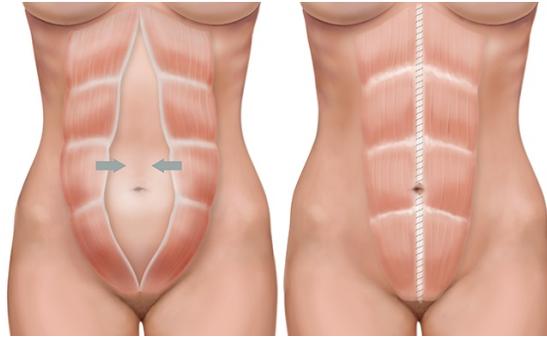
a) Skin and subcutaneous cellular tissue

Changes in the skin and the subcutaneous tissue are very common and consist of: Increasing sebaceous gland activity and sweating, hyperpigmentation, which affects 50-75% of women and has a particularly effect on the face, abdominal white line and mammary areola. (<http://www.creeaza.com/familie/medicina/Modificari-morfofunctionale-al171.php> - 27.07.2019)

b) The abdominal wall

Separation of abdominal muscles is a problem faced by many of the future moms and is very common.

Physical exercise and especially Pilate exercises can help to fortify and tonify the muscles after the connective tissue is healed. Most likely is the onset of muscular fortifier before pregnancy if diastase is not already installed. If it does not self-repair within 8 weeks of birth, diastase can be remedied by physical therapy and can be eradicated by surgery called abdominoplasty.



Picture 1. Abdominal diastasis

Source:

https://www.google.ro/search?q=diastaza+abdominala+forum&dcr=0&source=lnms&tbm=isch&sa=X&ved=0ahUKEwj45Ibko5baAhWQZ1AKHQyCBS4Q_AUICigB&biw=1517&bih=735#imgsrc=wprJMqo_ekfa0M - 18.07.2019

c) Musculoskeletal system

During pregnancy, the musculoskeletal system also suffers, the calcium content of the bones decreases, but at the same time their elasticity increases. The joints usually become more lax, especially in the sacroiliac joints, the spine and the pubic symphysis. (<http://www.creeaza.com/familie/medicina/Modificari-morfofunctionale-al171.php> - 27.07.2019)

Increasing the strength and strength of these muscles is one of the main goals of Pilates exercises.

d) Respiratory system

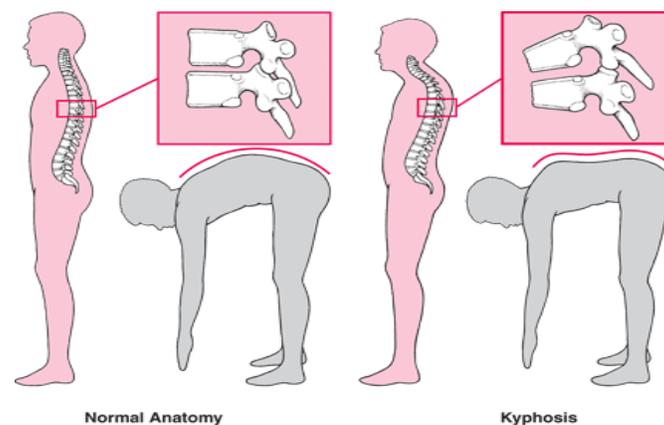
Increased diaphragm mobility is due to diminishing the tone of the obesity muscles, and the enlargement of the chest is due to the horizontal alignment of the ribs and the opening of the Xifoid angle. Current respiratory volume increases progressively from the

third month of pregnancy. The reserve respiratory volume and the residual air at the same time decrease. As a result, the oxygenated air will be diluted in a smaller volume of alveolar air. (Paladi Gh., Cernetchi O., 2006, p. 185)

2. Kyphosis

An increased curve in the thoracic region is termed kyphosis, often common with aging is becoming increasing more prominent in populations who spend a majority of their working day seated in front of a computer. Postural deviations known to accompany kyphosis can include jutting chin, rounded shoulders, rounded upper or mid back and possibly a tilted pelvis when standing.

Strengthening exercises for your back muscles can be helpful in correcting posture” (Kyphosis). BASI Pilates states that correction focuses on strengthening the thoracic extensors and stretching the anterior shoulder muscles [...] and pectorals (Study Guide 44).



Picture 2. Normal and Kyphosis anatomy

Source: <https://www.merckmanuals.com/home/children-s-health-issues/bone-disorders-in-children/kyphosis>- 21.08.2019

3. Case study

Subject S.C. presented at the Pilates studio with the following conditions:

- physically active pregnancy / practice of pilates exercises for 3 years;
- pregnant woman who has received the consent of the specialist doctors to participate in this study;
- gestational age of 1-8 weeks.

Exercise Plan – Active Pregnancy

Pathological phenomena specific to the pregnancy, based on which the prophylactic plan based on Pilates exercises was applied:

Initial assessment:

- kyphosis of the thoracic spinal region;
- Lumbar pain without irradiation.

Proposed objectives: psychological relaxation by specific methods, control of lumbar pain, prophylaxis of food overweight, muscular relaxation by prenatal massage, control of pressure on the pelvic organs by raising and supporting the abdomen by means of kinetic bands, respiratory facilitation, facilitating the venous circulation, facilitating the return of the placenta for a natural birth.

Techniques and methods applied: general prenatal education, general relaxation methods, prenatal massage, prenatal kinesiotaping, nutrition, posture facilitators of breathing, venous circulation and placental return, control of lumbar pain through postures and stretching of the extremities.

4. BASI program

In the 1st trimester we focus on the following aspects:

- Neutral spine;
- Extension of thoracic spine;
- Flexion of lumbar spine
- Transverse abdominus and oblique strenghtening;
- Pelvic floor exercises (Kegel exercises)

The 2nd trimester includes the following exercises (Table 1):

Table 1

Exercises utilized in 2nd trimester

	Exercises	Machine/object	Methodological Indications / Purpose
Warm Up	Roll down Spine twist supine Leg lifts/Leg changes	Mat	<ul style="list-style-type: none"> - We do the half roll down with the lumbar region stick to the wall. - With a little ball between the knees focusing on the adductors and the pelvic floor, more than the obliques. We focus more on stretching.
Foot Work	Parallel heels Parallel toes V position toes Open V heels Calf raises Prances Single leg heel Single leg toes	Reformer	<ul style="list-style-type: none"> - We use a fit ball supported on the shoulders rest to elevate the the head and torso of the client. Because she has varicose vains on lower limbs, calf raises help her to improve the circulation.

Abdominal Work	<p>Chest lift</p> <p>Reach (modified version)</p> <p>Round back</p> <p>Tilt</p> <p>Twist</p>	<p>Spine corrector</p> <p>Reformer (Short box)</p>	<ul style="list-style-type: none"> - We use a fit ball. - We don't lift the arms overhead and straight the legs. We focus on the c shape of the spine and mostly on the extension (to stabilize the shoulder blades) - Without hinging back.
Hip Work	<p>Frog</p> <p>Circles (down, up)</p> <p>Openings</p>	<p>Reformer</p>	<ul style="list-style-type: none"> - Constant attention to keep the pelvis and spine stable while we work the adductors and hamstrings.
Spinal Articulation	<p>Spine stretch</p>	<p>Mat</p>	<ul style="list-style-type: none"> - For this exercise we articulate one vertebra at a time, keeping the lumbar region stable. We use a fit ball stick to the wall to be more focused when we return.

Stretches	Shoulder stretch Overhead stretch Side stretch Spine twist standing	Pole series	- We use a fit ball for standing at the beginning and focus more on the breathing. After this we start to move our attention on the shoulders and keeping the ribs closed.
FBI	Knee stretch group Flat back	Reformer	- The stabilization of the trunk and shoulder blades with a little movement of the carriage.
Arm Work	Push through group Shoulder adduction single arm	Cadillac	- We focus on scapular stability and alignment.
FBI 2	-	-	- We didn't do this block
Leg work	Single leg skating	Reformer	- Maintaining the pelvis stable we focus on the adductors and glutes and keeping the alignment of the spine.
Lateral flexion and rotation	Side kneeling stretch	Wunda chair	- We focus more on the stretch, not on the flexion and keeping the pelvis still. We use less springs and elongate the spine.
Back extension	Pulling straps Three half roll down	Reformer	- From seated with control on the extension of the spine. - At the end of the class.

The 3rd trimester includes the following exercises (Table 2):

Table 2

Exercises utilized in 3rd trimester

	Exercises	Machine/object	Methodological
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			Indications / Purpose
Warm Up	<ul style="list-style-type: none"> - Sitting on a ball with arms relaxed on the legs and elongated spine, we move the ball forward (retroversion of the pelvis), come back (in neutral) and backwards (anteversion of the spine). - Same neutral position of the pelvis, we move the ball right and left with lateral flexion of the pelvis. We keep the vertebral elongation. - Sitting on a ball we activate the pelvic floor and lift alternately the sole of the ground. <p style="margin-left: 40px;">Spine twist supine</p> <p style="margin-left: 40px;">Leg lifts/Leg changes</p>	Mat	<ul style="list-style-type: none"> - We put the legs on the floor and let them go side to side, focusing on stretching. - Like a variation we bend one leg and extend the other.

Foot Work	Parallel heels Parallel toes V position toes Open V heels Calf raises Single leg heels Single leg toes	Wunda Chair	<ul style="list-style-type: none"> - The foot work on wunda chair helped my client to keep a good posture. We used less springs also to reduce the pressure on pelvis and pubic simphisis. - The wunda chair is stick to the wall and we put a ball between the back and the wall.
Abdominal Work	Single leg stretch Double leg stretch	Mat	<ul style="list-style-type: none"> - We use two pillows one over the other, the lower cushion being longer and where she puts the shoulder blades. On the pillow above she rests her head. - One leg on the floor and the other bend with the arms pressing and than change the leg. - One leg on the floor and other extended.
Hip Work	Single leg series <ul style="list-style-type: none"> - Changes - Scissors - Circles (forward, back) 	Cadillac	<ul style="list-style-type: none"> - We use a cushion supporting the belly for relaxation. - When the belly grew from sitting we let one leg on the side (and maintain 10" the position) and than change the leg.
Spinal Articulation	Spine stretch	Mat	<ul style="list-style-type: none"> - Sitting with the legs in diamond position with a cushion under the sitting bones. We activate the pelvic floor and hug a tree with the arms and then stretch each vertebra all the way up.

Stretches	Hip flexors	Ladder barrel	- As we get at the moment when the baby and belly grow, we focus more on stretching the psoas and the abductor muscles. If the psoas isn't contracted the baby can come easier. The exercise is from standing against the wall and push the pelvis forward (hold the position for 7 or 8 breaths) trying to relax the pelvis downwards and forward.
FBI	Thigh stretch with roll up bar	Cadillac	- Our focus was to stabilize the shoulders girdle and open the hips as the pelvis is tilted slightly.
Arm Work	Shrugs Triceps press sit	Wunda chair	- In this position I can observe the posture and if she has any imbalance. Because of her kyfosis the stabilization of the pelvis and the shoulders girdle is important before doing the movement.
FBI 2	-	-	- We didn't do this block
Leg work	Squats	Cadillac	- At the end of the pregnancy we adapt the exercise. We put a little ball between the knees as she sits on a fit ball. We focus to keep the pelvic floor active and while she activates the stabilizer muscles of the lumbo-pelvic region, she lifts the pelvis and gets into a half squat position activating the adductors by passing the ball.

Lateral flexion and rotation		Mat	<ul style="list-style-type: none"> - Adapted exercises from all four: lateral flexion of the pelvis and spine (looking at the heels); bring the straight leg from back to the side with lateral flexion of the spine (we use also the kegal exercises) and breathing.
Back extension	Cat stretch	Mat	<ul style="list-style-type: none"> - We did the exercise also from standing with the palms on the quads. We try to keep the vertebral muscles tonic and strong but also to stimulate the pelvic floor muscles by using the breathing properly.

5. Conclusions

Informing the patients is absolutely vital for triggering the importance of starting to go to specialist consultations, thus contributing to the education of women and the distinction between normal changes and notions of physiological disturbances during pregnancy.

I also believe that the most important aspect of beneficial results for patients is the assumption and observance of personalized prophylactic plans, but also the collaboration and support provided by the family. To achieve maximum efficiency, collaboration and guidance of patients by specialists is recommended to be necessary for a perfect mutual fit.

Methods, working methods and prophylactic plans are established following the patient's anamnesis and evaluation, being unique to each organism, without applying a single prophylactic model to several subjects.

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