

Comparing the Effects of Swiss Ball and Mat Exercise for Core Strengthening in Post Natal Women

Dr. M.S. Sundaram*¹, Dr. P. Senthil Selvam², Miss. T. Deepika³ & Dr. Logeshwari Selvaraj*⁴

1. *M.P.T (Sports), Ph. D, Professor, School of Physiotherapy, Vels Institute of Science, Technology and Advanced Sciences (VISTAS) Sundaram.sp@velsuniv.ac.in*
2. *M.P.T (Ortho), Ph. D, HOD & Professor, School of Physiotherapy, Vels Institute of Science, Technology and Advanced Sciences (VISTAS)*
3. *M.P.T, School of Physiotherapy, Vels Institute of Science, Technology and Advanced Sciences (VISTAS)*
4. *M.P.T (Neuro), (Ph.D), Assistant Professor, School of Physiotherapy, Vels Institute of Science, Technology and Advanced Sciences (VISTAS) Lokeshwari.sp@velsuniv.ac.in*

Corresponding Author:

* DR. M.S. Sundaram MPT (sports), Ph.D, Sundaram.sp@velsuniv.ac.in / lokeshwari.sp@velsuniv.ac.in

Abstract:

Background : Postnatal exercises during postpartum period helps to improve the quality of life, improving physical, mental, social and general wellbeing, To avoid weakening of core muscles, accumulation of excessive belly fat and to avoid further primary and secondary complications, hence this study aims to compare the effect of Swiss Ball and Mat Exercise for Core Strengthening in Post Natal Women. **Methodology:** A comparative study was done for 30 postnatal women aged 21-35 years from Chennai Then divided into two groups using convenient sampling method group A (n=15) Experimental group and group B(n=15) control group. The exercise program was given with a total period of 8 weeks. The outcome measures used were Seated medicine ball throw (SMBT) and MMT (Manual muscle testing) for grading abdominal muscle. **Result:** There was significant improvement in core strengthening. Although improvement was seen in both the groups but group-A (swiss ball) improved better compared to group-B (mat exercise). **Conclusion :** The Present study states that the experimental group (group A) which did the exercises using swiss ball had better improvement than the mat based exercises. Hence the postnatal mothers benefited more while using unstable surface. **Key words:** core strengthening, Seated medicine ball throw, postpartum women, abdominal muscle

Introduction :

Pregnancy is considered as the most important phase in a women's life. Besides all the hormonal and physiological changes affecting women during this period, probably the most obvious morphological alteration during pregnancy is the increasing weight and dimensions of the uterus, influencing maternal trunk musculoskeletal morphology, particularly the abdominal musculature⁽¹⁾ by the end of pregnancy each muscle cell in the uterus increases approximately 10 times over its pre-pregnancy length. Once uterus expands upward and leaves the pelvis, it becomes an abdominal organ rather than the pelvic organ. The abdominal muscles, particularly both sides of rectus arc stretched to the point of their elastic limit by the end of the Pregnancy, leading to greater decrease the muscle's ability to generate strong abdominal contraction. Abdominal muscles are actually four layers of the muscles which span from the breastbone and ribs to the pelvis. Working together, these muscles function as a corset to support the spine and pelvis. In addition to flexing and rotating the trunk, the abdominal muscles are known as primary "core muscles". because they stabilize the lower back during all movements.

During pregnancy, hormonal changes caused by relaxin, progesterone and estrogen combined with uterine growth cause stretching of the abdominal muscles, affecting mainly the rectus abdominus. Also, anterior pelvic tilting with or without lumbar hyperlordosis, affects the insertion angle of pelvic and abdominal muscles and influences postural biomechanics generating a deficit in the support of the pelvic abdominal organs. Furthermore, as pregnancy progresses and the abdominal muscles stretch, a loss in the force vector and a decrease in contraction strength of rectus abdominus muscles occur⁽²⁾.

Abdominal musculature plays a crucial role in trunk control and function. Compromise of abdominal musculature due to diastasis rectii can diminish the mechanical control of abdomen and its function. This includes cosmetic defects, psychological discomfort (i.e. body image), physical discomfort such as low back pain, bulging of the abdominal wall, abdominal wall weakness and reduced muscular abdominal strength. Limitations during physical activity such as trunk flexion, trunk rotation, trunk side bending, respiration difficulty and support of abdominal viscera⁽²⁾.

The postpartum period starts following child birth and ends at 42 days are associated with complications like postpartum hemorrhage, deep vein thrombosis, pulmonary embolism, gravitational edema, puerperal infection, breast feeding problems.

Many women continue or even begin to exercise during pregnancy, and postnatal women are encouraged to resume abdominal exercises shortly after delivery, to restore their abdominal figure and fitness. It is important to begin postnatal abdominal exercises that are graded to the rate of recovery and the pre-delivery level of fitness, as gradual abdominal muscle strengthening is safe and effective. This not only helps with the physical appearance; but it also keeps the back healthy as strong abdominals create a stable core to support the lower back during daily activities. With a good

strengthening program, the mother can safely rebuild these core muscles to regain the pre-pregnancy appearance and meet the demands of carrying and lifting her baby⁽²⁾.

The American College of Obstetricians recommends exercise for pregnant women stating its benefits are maintaining muscle tone, strength, and endurance as well as improving overall well-being and reducing low back pain and the pain associated with labor. However, there is little evidence available about muscular changes and the effect and safety of different abdominal exercises during and after pregnancy, It is evident that delivering proper care to improve the health and quality of life of women is a must, that needs a regular evidence based exercise program for postpartum care⁽⁴⁾

Researchers have found that Swiss ball and mat exercise strengthen core in post natal women. In this study Swiss ball and mat exercise are compared in strengthening the core muscles in postnatal women. In the previous study, effect of postnatal exercises on quality of life in immediate postpartum mothers: A clinical trial showed that "postnatal exercises namely aerobic exercises, general body strengthening exercises and pelvic floor muscle exercises were given. Postnatal exercises during postpartum period helps to improve the quality of life, improving physical, mental. social and general wellbeing"⁽¹⁵⁾, Hence this study was done to know the effects of Swiss ball exercise and mat exercise for core stability in postnatal women.

Methodology: A comparative study was done for 30 postnatal women from Chennai based on the inclusion criteria : Age 21-35 years, Seated Medicine Ball Test (less than 10), From the third day or pregnancy, Normal delivery, Postnatal women (1 or 2 delivery) and exclusion Criteria: Medical condition making it impossible to perform exercises Eg: Hypertension. , Caesarean section, Major upper and lower limb fractures, Recent abdominal surgery. Eg: Cholecystectomy and any cardiovascular disease. Then divided into two groups using convenient sampling method group A (n=15) Experimental group and group B(n=15) control group. The exercise program was given with a total period of 8 weeks. The outcome measures used were Seated medicine ball throw (SMBT) and MMT (Manual muscle testing) for grading abdominal muscle

Procedure:

Participants who met the inclusion criteria and signed the consent letter were conveniently assigned to one of the two groups. Proper precautions were taken to prevent fall or discomfort. Swiss ball training was given before implementation if protocol to make the subject comfortable with swiss ball (Individual was asked to sit ideal over the swiss ball for about 15 minutes before treatment session). General instructions like provoking pain or any discomfort was taken into consideration for patient's comfort. Pre-test values were assessed by Seated Medicine Ball Test and Manual Muscle Grading.

Seated medicine ball throw (SMBT)

- The subjects stand with the back to the wall, on a mat facing the area to which the ball is to be thrown, and with feet extended and slightly apart. The ball is held with the hands (two hands) on the side and slightly behind the center. A ball is brought to the chest, and then thrown vigorously out as far as possible. The back should remain in contact with the wall at all times. Three attempts are allowed. The distance from the wall to where the ball lands are recorded. The best results of three throw was recorded. The measurements is recorded to the nearest 10 cm. The participants were allocated into experimental group (group A: n=15) swiss ball exercises and control group (group B: n=15) mat exercises.

GROUP-A (15) swiss ball exercises: participants were taught the following exercises: Squat And Reach, Abdominal Crunch , Bridge With Heel Dig, Stability Ball Plank, Abdominal Ball Raise, Side Exercise, Reverse Crunch, Swiss Ball Opposite Arm And Leg Lift, Hip Crossover , Swissball Body Weight Wall Squat and Swiss Ball Rollout with each exercises of 10 repetitions.

GROUP- B (15) mat exercises: participants were taught the following exercises: bridge, pelvic tilt, the tabletop, side-leg glides , knee touch downs, heel slides, towel pulse, single leg stretch, abdominal crunch, sit ups, stomach tightener and leg stretch

Both the groups Swiss ball and Mat exercises were done for 45 minutes with 10 repetitions each at regular intervals for about 5 days per week. Protocol was programmed for about 6 Weeks.

Data Analysis

Data analysis consisted of basic statistics to determine pre- and post-test means and standard deviations. A paired samples t-test was used to determine if a significant change took place in the measurements at post-test in seated medicine ball throw test and muscle grading.

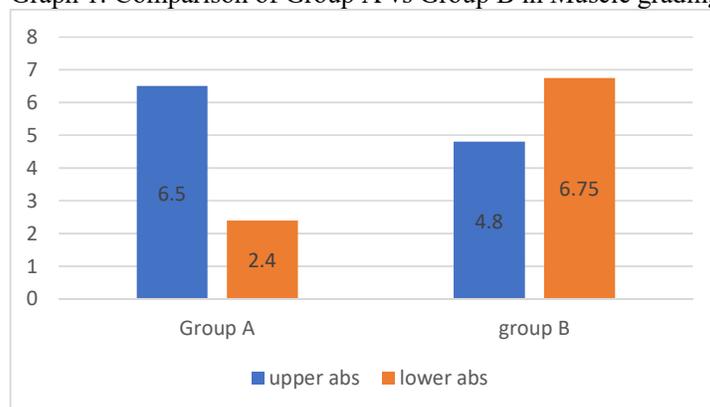
TABLE 1: Effect of swiss ball exercises in Muscle grading (Upper abdomen, Lower abdomen) and Seated medicine ball throw test in Group A (experimental group)

OUTCOME MEASURE	MEAN VALUE		STANDARD DEVIATION		t-VALUE	p-VALUE
	PRE	POST	PRE	POST		
Upper Abdomen	4.15	6.5	1.45	1.25	6.1430	<0.0001
Upper Abdomen	6.45	8.55	1.23	1.00	5.9148	<0.0001
Seated ball medicine test	1.05	1.27	0.04	0.53	13.7941	0.0002

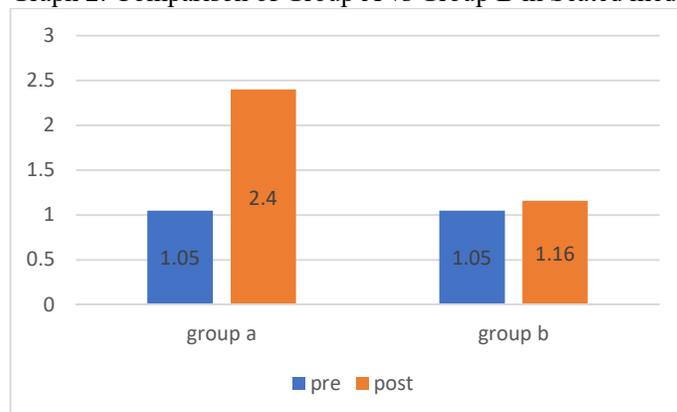
TABLE 2: Effect of Mat exercises in Muscle grading (Upper abdomen, Lower abdomen) and Seated medicine ball throw test in Group B (control group)

OUTCOME MEASURE	MEAN VALUE		STANDARD DEVIATION		t-VALUE	p-VALUE
	PRE	POST	PRE	POST		
Upper Abdomen	3.75	4.8	1.45	1.25	2.4300	<0.0001
Upper Abdomen	5.75	6.75	0.79	0.79	4.0212	<0.0001
Seated ball medicine test	1.05	1.16	0.04	0.198	2.3703	0.0002

Graph 1: Comparison of Group A vs Group B in Muscle grading (Upper abdomen, Lower abdomen)



Graph 2: Comparison of Group A vs Group B in Seated medicine ball throw test



RESULT: The above pre-test and post-test mean value tables show that both the groups had a significant improvement in core strengthening. Although improvement was seen in both the groups but group-A (swiss ball) improved better compared to group-B (mat exercise).

Discussion: The present study aimed to determine the impact of swiss ball and mat exercise in the postpartum women. The obtained results showed that the group A (swiss ball) had better improvement in abdominal exercise gram produced a pronounced reduction in waist hip ratio, and inter-recti separation and also caused significant increase in abdominal muscles strength (peak torque, maximum repetition total work and average rower) higher than the use of abdominal belt in the postpartum women.

In this study, stated that the effects of exercise with swiss ball and mat in the postpartum women for abdominal strengthening. Weak abdominal muscles may also have a role in the pathogenesis of back pain after pregnancy. Strengthening of the abdominal muscles and good physical fitness reduced the incidence of lower back pain. Women who exercise during the postpartum period are more likely to have positive moods, less anxiety and depression, and increased vigor following exercise. Sleep disturbances in postpartum women commonly result in feelings of fatigue and a diminished amount of energy. Fatigue may be a major deterrent to return to functional ability however, exercise may help to improve psychosocial well-being and increase feelings of energy. The result stated that the swiss ball and mat exercise is equally effective in strengthening core muscles in postpartum women. The sample size was small only normal delivery subjects were included both primigravida and multigravida were included; absence of control group.

Conclusion: The Present study states that the experimental group (group A) which did the exercises using swiss ball had better improvement than the mat based exercises. Hence the postnatal mothers benefited more while using unstable surface.

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