

EFFECT OF 8 WEEK PILATES EXERCISE TRAINING PROGRAM ON BALANCE OF UNTRAINED MALE YOUTH BOYS

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ABSTRACT

The purpose of this study was to investigate the effect of 8 week Pilates exercise training program on balance of untrained male youth boys. Thirty healthy untrained male individuals participated in this study. The participants were divided into two groups as Pilates exercise groups (N=15) and control group (N=15). The Pilates exercise group was taken 8 weeks training program and control group was not taking any kind of training program. The balance was measured with the help of Standing Stork Test. The data obtained from the measurements were recorded in the SPSS Windows (17.0) software package. Analysis of Co-Variance was used to find out the effect of Pilates exercise on balance. The level of significance was set at 0.05. The mean of pre test for Pilates exercise group (10.133) and control group (9.066). Further the mean of post test for Pilates exercise group (20.200) and control group (9.400). The result of ANCOVA shows that there was significant effect of 8 week Pilates exercise training program on balance. In the light of finding it was conclude that Pilates exercise training program improves balance of male youth boys.

Key Words: Pilates Exercise, Balance, Youth and Untrained Male.

INTRODUCTION:

Pilates is an exercise system developed over a period of approximately 50 years, beginning in the 1920s by Joseph H. Pilates (Anderson and Spector, 2000). Pilates-based exercises can be performed on the floor, termed “mat work” by the Pilates community, or on a variety of machines, termed “apparatus work.” Perhaps the most commonly used apparatus is the Reformer. The Reformer is a single bed frame that is equipped with a carriage that slides back and forth using springs to regulate tension and resistance. Cables, bars, straps, and pulleys allow a variety of Pilates-based exercises to be done from multiple positions. Postural muscles, including the transverse abdominis and internal and external oblique muscles, provide trunk

stability, which is crucial to balance (Mullhearn and George, 1999). Pilates-based exercise incorporates the principles of trunk stability, which is also referred to as core stability or core control (Akuthota and Nadler, 2004). According to postural set over a base of support and can be reliably measured using the functional reach test (FRT) (Duncan et al., 1990). The FRT requires the subject to stand upright with feet approximately shoulder width apart and arms raised to 90° of shoulder flexion while making a fist. A baseline measurement of the third metacarpal is taken using a wall-mounted yardstick and the subject is asked to lean as far forward as possible without changing their base of support. A new measurement of third metacarpal position is taken and the total amount of excursion is recorded. The test is repeated a total of three times and the average excursion, in centimeters, is the FRT score.

The balance or positional stability is the ability to maintain a state and showing reaction to a permanent force. Many of our body's physical characteristics allow us to show reactions. In all forms of standing, sitting, and lying down, having balance is essential for doing coordinated moves. To maintain the balance for a good body performance, many parts of the brain areas are needed to cooperate with each other. Cerebellum is the main center for controlling balance, eyes, ears and all the nerves that go through hands and legs are also important for keeping a balance. Any problems in any of these areas can create some disorder in body's balance.

METHODOLOGY:

Thirty healthy untrained male individuals participated in this study. The participants were divided into two groups as Pilates exercise groups (N=15) and control group (N=15). The Pilates exercise group was taken 8 weeks training program and control group was not taking any kind of training program. The balance was measured with the help of standing stork test. The data obtained from the measurements were recorded in the SPSS Windows (17.0) software package. Analysis of Co-Variance was used to find out the effect of Pilates exercise on balance. The level of significance was set at 0.05.

Training program

Pilates exercise program was made following the six main principles:

- Centering is the foundation of all movements, requiring core muscle stabilization prior to initiating arm or leg movements.
- Control refers to the ability to monitor movements, while performing them with the correct mindful intent, from the appropriate muscle groups.
- Precision relates to the focus on completing an exercise using the proper form and execution.
- Concentration places form and the mental fortitude to perform an exercise as the focal point.
- Breath refers to maintaining proper breathing techniques crucial to performing these exercises (Inhalation is used to prepare for the movement and exhalation is used to execute the movement, activate core muscle support, and intensify the movement).
- Flow is the connection of one movement to the next and is developed over time as the patient becomes familiar with the exercises.

RESULT:

Exercise group did lower extremity Pilates exercises for three days a week during 8 weeks. All Pilates sessions were given and supervised by investigator. Pilates exercise program was developed by the investigator for this study, based on Levine et. al.'s Pilates training. Each session lasted one hour. The class consisted of 20 minutes warm up and cool down (10 minutes before and 10 minutes after the exercises) and 40 minutes (increased gradually from 20 minutes) of Pilates exercises. The repetitions of Pilates exercises were increased gradually from 5 repetitions. In the second week the participants did 6 repetitions, in the third week 7 repetitions and in the fifth week 8 repetitions were done. Between the sixth and eighth weeks, the participants performed 10 repetitions.

| Weeks | Exercises |
|-------|---|
| 1 | Hundreds 1/2/3 |
| 2 | One leg stretch 1, Double leg stretch 1/2, Clam |
| 3 | One leg stretch 2 Shoulder bridge 2 |
| 4 | Shoulder bridge 2 Hip twist |

| | |
|---|------------------------------------|
| 5 | Scissors 1, One leg kick |
| 6 | Scissors 2, Side kick 1 |
| 7 | Side kick 2, One leg circle 1/2 |
| 8 | Side kick 2, One leg circle 1/2 |

Control group did not do exercise during 8 weeks. Subjects were told not to change their lifestyle and not to participate in a regular exercise program or a sport, during the study.

Table 1
Descriptive Statistics of Experimental Group and Control Group in relation to Balance

Table 1 reveals the mean and standard deviation of balance, Pre Test Control (9.0667 ±3.844) Pilates Exercise Group (10.1333 ±4.1895), Total (9.600 ±3.987), Post Test Control (9.400 ±

| Observation | Group | N | Mean | Std. Deviation | Std. Error |
|-------------|------------------------|----|---------|----------------|------------|
| Pre Test | Control Group | 15 | 9.0667 | 3.84460 | .99267 |
| | Pilates Exercise Group | 15 | 10.1333 | 4.18956 | 1.08174 |
| | Total | 30 | 9.6000 | 3.98791 | .72809 |
| Post Test | Control Group | 15 | 9.4000 | 4.01426 | 1.03648 |
| | Pilates Exercise Group | 15 | 20.2000 | 5.49285 | 1.41825 |
| | Total | 30 | 14.8000 | 7.24640 | 1.32301 |

4.014), Pilates Exercise Group (20.200 ± 5.492), Total (14.800 ± 7.246) respectively.

Table – 2
Analysis of Variance of Comparison of Means of Experimental Group and Control Group in Balance

| Observation | Source of variance | Sum of Squares | df | Mean Square | F |
|-------------|--------------------|----------------|----|-------------|---------|
| Pre Test | Between Groups | 8.533 | 1 | 8.533 | 0.528* |
| | Within Groups | 452.667 | 28 | 16.167 | |
| | Total | 461.200 | 29 | | |
| Post Test | Between Groups | 874.800 | 1 | 874.800 | 37.800* |
| | Within Groups | 648.000 | 28 | 23.143 | |
| | Total | 1522.800 | 29 | | |

*Significant at 0.05 level, F value required to be significant at 1, 28 df = 4.20

The analysis of variance for balance indicated that the resultant F-ratio of 0.528 was insignificant in case of pre-test means from which it is clear that the pre-test mean does not differ

significantly and that the random assignment of subjects to the experimental groups was quite successful. The post-test means of the two groups yielded a F-ratio of 37.800 which was significant at 0.05 level of confidence. The F-ratio needed for significance with 1, 28 degree of freedom is 4.20 at 0.05 level of confidence.

Table –3

Adjusted Post Test Means of Experimental Group and Control Group in relation to Balance

| Group | Mean | Std. Error | 95% Confidence Interval | |
|------------------------|--------|------------|-------------------------|-------------|
| | | | Lower Bound | Upper Bound |
| Control Group | 9.920 | 0.737 | 8.407 | 11.432 |
| Pilates Exercise Group | 19.680 | 0.737 | 18.168 | 21.193 |

Table 3 reveal that the adjusted post test means of balance for Control group 9.920 and Pilates Exercise Group 10.680 and standard error of control group 0.737 and Pilates Exercise Group 0.737.

Table – 4

Analysis of Covariance of Comparison of Adjusted Post Test Means of Experimental Group and Control Group in Balance

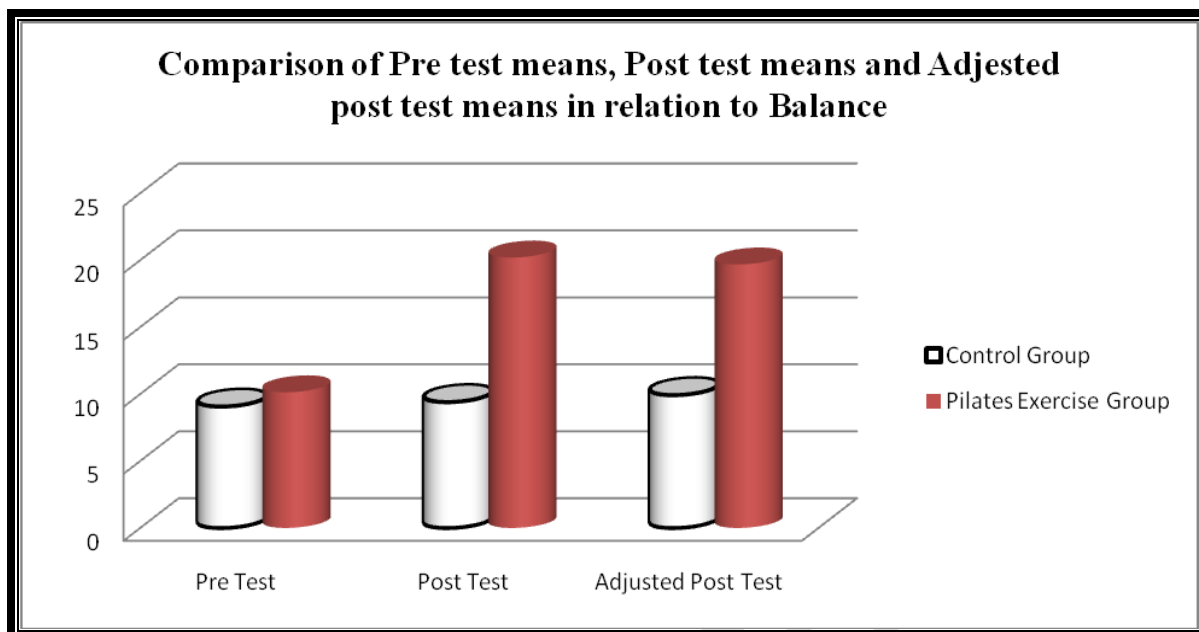
| | Sum of Squares | df | Mean Square | F |
|----------|----------------|----|-------------|---------|
| Contrast | 701.264 | 1 | 701.264 | 86.863* |
| Error | 217.976 | 27 | 8.073 | |

*Significant at 0.05 level, F value required to be significant at 1, 27 df = 4.23

Table 4 revealed that the difference between adjusted post means was found significant as the obtained F-ratio was 86.863. The F-ratio needed for significance at 0.05 level of confidence was 4.23. Thus, significant difference exists between experimental and control group in relation to balance.

Fig.-1

Comparison of Pre test, Post test & Adjusted Post test means



Fig

DISCUSSION:

In the present study, the researcher investigated the effects of 8 weeks Pilates exercise training on balance and the results showed that the Pilates exercises improved balance of untrained male youth boys. Balance is a complex phenomenon, requiring integration of the sensory, musculoskeletal, and nervous systems (Akuthota and Nadler, 2004; Shumway-Cook and Woollacott, 2001). Pilates based exercise challenges these systems while focusing on the principles of breathing, control, centering, precision, concentration, and flow (Anderson and Spector, 2000). Bandy et al. (1997) determined that a minimum of a 30 s static hold at the terminal position of a muscle is required in order to make a plastic change in muscle length. Pilates-based exercise does not typically include this type of sustained end-range stretching, suggesting that the improvements in dynamic balance in our exercise group were likely due to an increase in core stability, or improved motor control, rather than an increase in flexibility of the gastrocnemius-soleus muscle group. Zakas et al. (2005) have reported on the acute effects of a variety of stretching protocols on ROM in 20 sedentary subjects aging 65–85 years old (mean age = 75.9). Their findings suggest that a single 60 s static stretch produces the same effect as two 30 s and four 15 s stretches. The difference, as it relates to the present investigation, is that

our subjects were tested using the FRT within 72 h of completing the Pilates program and not immediately afterward. Any acute effects of the Pilates exercise program were negated and we ultimately measured the lasting changes in dynamic balance.

CONCLUSION:

In the light of the findings, it was concluded that training of 8 weeks Pilates Exercise was sufficient to have a significant difference in the balance of untrained male youth boys.

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