



## **RESTING HEART RATE EFFECTS OF YOGIC PRACTICES INVOLVING RESISTANCE AND PLYOMETRIC TRAINING ON TEENAGE VOLLEYBALL PLAYERS**

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### **Abstract:**

The purpose of the study was to find out the effect of yogic practices with resistance training and yogic practices with plyometric training on resting heart rate among volleyball players. To achieve the purpose of the present study, forty five women volleyball players from Affiliated colleges of Bharathidasan University, Tiruchirappalli, India was selected as subjects at random and their ages ranged from 18 to 25 years. The subjects (N=45) were randomly assigned to three equal groups of fifteen subjects each. The requirement of the experiment procedures, testing as well as exercise schedule was explained to the subjects so as to get full co-operation of the effort required on their part and prior to the administration of the study. Pre test was conducted for all the subjects on resting heart rate. This initial test scores formed as pre test scores of the subjects. The groups were assigned as Experimental Group I, Experimental Group II and Experimental Group III in an equivalent manner. Experimental Group I was exposed to yogic practices with plyometric training, Experimental Group II was exposed to yogic practices with resistance training and Experimental Group III was exposed to yogic practices with combined plyometric and resistance training. The duration of experimental period was 12 weeks. After the experimental treatment, all the forty five subjects were tested on resting heart rate. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to statistical analysis using dependant 't' test and Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant, scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses. The yogic practice with combined plyometric and resistance training improved resting heart rate better than the yogic practice with plyometric training and yogic practice with resistance training on resting heart rate among women volleyball players.

**Key Words:** Yogic Practices, Plyometric, Resistance, Volleyball.

### **Introduction:**

Yoga is a distinctive Indian tradition of ancient origin for health and happiness. It imparts both sound body and sound mind to the practitioner. Yoga is a Sanskrit term. It represents yoke, which symbolically means to join or to unite. Yoga is intended for union or harmony of mind and the body. Sun is the basis of life on our earth. This is the axis of our solar system around which all the planets revolve. Almost in all religions the sun is worshiped in one form or the other. Suryanamaskar is one of the most effective yogic practices to maintain the fitness. Suryanamaskar is a set of 12 body postures which are performed serially without any pause. When all the 12 postures are completed, makes one round. Physical fitness is a prime asset and an athlete must possess strength, endurance, speed and agility. Among the training methods, the most popular result oriented method is "resistance training". It not only develops the strength and the power which the athlete needs, but also perfects the execution of the skill.

Plyometrics involve maximal muscle contractions at the highest velocity possible. By using this type of training properly, physical performance can be improved. The purpose of plyometric training is to decrease the ground contact time of an athlete while sprinting, jumping, or kicking. Plyometric training is very intense, high nervous system demand activity that must take into account four factors: training load, basic strength, Skill and progression. Scientific results have produced valid and precise information about the relative effectiveness of different training methods. As a result we are more informative and well versed about the functioning of the body system than ever before. Resistance training is a kind of physical exercise specializing in the use of resistance to induce muscular contraction which builds the strength, anaerobic endurance, and size of skeletal muscles. Volleyball is a most popular and vigorous as well as strenuous game in all over the world. The volleyball players were needs a very good physical fitness to play the game without any physical hurdle. Every individual player can maintain his fitness level to with stand in the field during the full time play. On the coaching point of view the coaches wish to train their players on the basis of scientific principles for better performance. The investigator was interested to find out experimentally the efficacy of selected yogic practice

with plyometric and resistance training on selected physical, physiological and psychological variables among college level women volleyball players.

#### **Methodology:**

The purpose of the study was to find out the effect of yogic practices with resistance training and yogic practices with plyometric training on resting heart rate among volleyball players. To achieve the purpose of the present study, forty five women volleyball players from Affiliated colleges of Bharathidasan University, Tiruchirappalli, India was selected as subjects at random and their ages ranged from 18 to 25 years. The subjects (N=45) were randomly assigned to three equal groups of fifteen subjects each. The requirement of the experiment procedures, testing as well as exercise schedule was explained to the subjects so as to get full co-operation of the effort required on their part and prior to the administration of the study. Pre test was conducted for all the subjects on resting heart rate. This initial test scores formed as pre test scores of the subjects. The groups were assigned as Experimental Group I, Experimental Group II and Experimental Group III in an equivalent manner. Experimental Group I was exposed to yogic practices with plyometric training, Experimental Group II was exposed to yogic practices with resistance training and Experimental Group III was exposed to yogic practices with combined plyometric and resistance training. The duration of experimental period was 12 weeks. After the experimental treatment, all the forty five subjects were tested on resting heart rate. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to statistical analysis using dependant 't' test and Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant, scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses.

#### **Results:**

**Table 1: Computation of Analysis of Covariance of Mean of Yogic Practices with Plyometric Training, Yogic Practices with Resistance Training and Yogic Practices with Combined Plyometric and Resistance Training Group on Resting Heart Rate**

|                 | YPWPTG | YPWRTG | YPWCPRTG | Source of Variance | Sum of Squares | df | Means Squares | F-ratio |
|-----------------|--------|--------|----------|--------------------|----------------|----|---------------|---------|
| Pre-Test Means  | 70.93  | 71.06  | 70.80    | BG                 | 0.53           | 2  | 0.26          | 0.55    |
|                 |        |        |          | WG                 | 20.26          | 42 | 0.48          |         |
| Post-Test Means | 68.33  | 68.40  | 66.13    | BG                 | 49.91          | 2  | 24.95         | 71.46*  |
|                 |        |        |          | WG                 | 14.66          | 42 | 0.34          |         |

An examination of table - I indicated that the pre test means of yogic practices with plyometric training, yogic practices with resistance training and yogic practices with combined plyometric and resistance training group were 70.93, 71.06 and 70.80 respectively. The obtained F-ratio for the pre-test was 0.55 and the table F-ratio was 3.22. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that there were no significant difference between the experimental and yogic practices with combined plyometric and resistance training group indicating that the process of randomization of the groups was perfect while assigning the subjects to groups.

The post-test means of the yogic practices with plyometric training, yogic practices with resistance training and yogic practices with combined plyometric and resistance training group were 68.33, 68.40 and 66.13 respectively. The obtained F-ratio for the post-test was 71.46 and the table F-ratio was 3.22. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that the differences between the post test means of the subjects were significant.

The adjusted post-test means of the yogic practices with plyometric training, yogic practices with resistance training and yogic practices with combined plyometric and resistance training group were 68.33, 68.40 and 66.12 respectively. The obtained F-ratio for the adjusted post-test means was 68.89 and the table F-ratio was 3.23. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. This proved that there was a significant difference among the means due to the experimental trainings on resting heart rate.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. The results were presented in table 2.

**Table 2: The Scheffe's Test for the Differences between the Adjusted Post Test Paired Means on Resting Heart Rate**

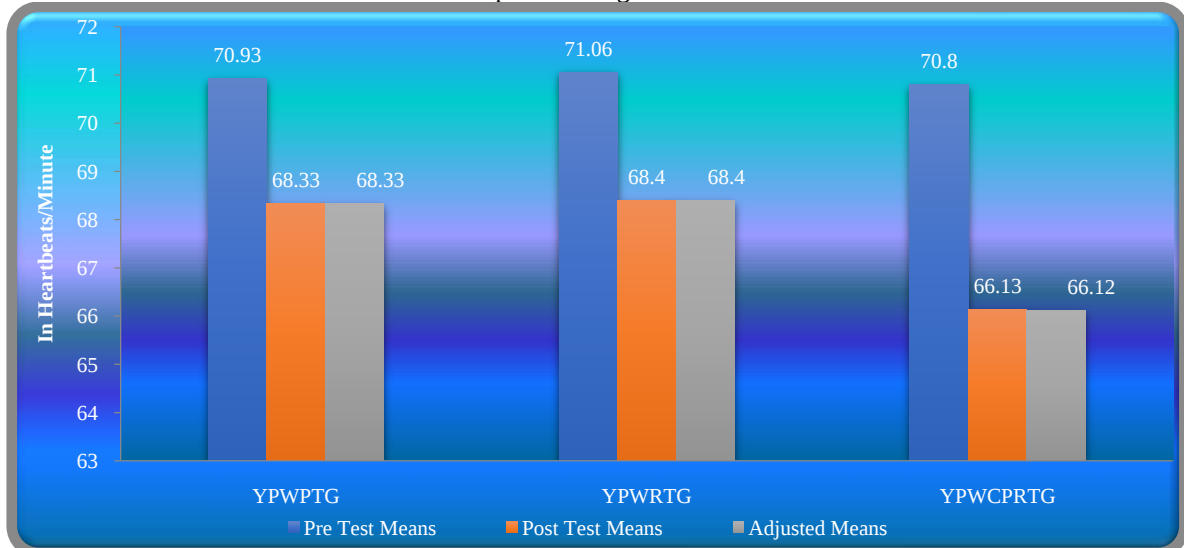
| Adjusted Post-Test Means |        |          | Mean Difference | Required CI |
|--------------------------|--------|----------|-----------------|-------------|
| YPWPTG                   | YPWRTG | YPWCPRTG |                 |             |
| 68.33                    | 68.40  | ---      | 0.07            | 0.54        |
| 68.33                    | ---    | 66.12    | 2.21*           |             |
| ---                      | 68.40  | 66.12    | 2.28*           |             |

\* Significant at 0.05 level of confidence

The multiple comparisons showed in Table II proved that there existed significant differences between the adjusted means of yogic practices with resistance training with yogic practices with combined plyometric and resistance training group (2.21), yogic practices with plyometric training with yogic practices with

combined plyometric and resistance training group (2.28). There was no significant difference between yogic practices with plyometric training and yogic practices with resistance training (0.07) at 0.05 level of confidence with the confidence interval value of 0.54. The pre, post and adjusted means on resting heart rate were presented through bar diagram for better understanding of the results of this study in figure 1.

Figure 1: Pre Post and Adjusted Post Test Differences of the Yogic Practices with Plyometric Training, Yogic Practices with Resistance Training and Yogic Practices with Combined Plyometric and Resistance Training Group on Resting Heart Rate



#### Conclusion:

From the analysis of the data, the following conclusions were drawn:

- The yogic practice with plyometric training decreased the resting heart rate among women volleyball players.
- The yogic practice with resistance training decreased the resting heart rate among women volleyball players.
- The yogic practice combined with plyometric and resistance training decreased the resting heart rate among women volleyball players.
- The yogic practice with combined plyometric and resistance training improved resting heart rate better than the yogic practice with plyometric training and yogic practice with resistance training on resting heart rate among women volleyball players.

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