

Research Paper

IMPACT OF AQUATIC AND LAND CIRCUIT TRAINING PROGRAMME ON LOWER BODY STRENGTH ENDURANCE AMONG ATHLETES**Dr.J. Suganthi¹, L.Priyadarshini²**

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Abstract

The purpose of the study was to find out the Impact of aquatic and land circuit training programme on lower body strength endurance among athletes, to achieve that 45 subjects aged from 14 to 17 years in Kavinadu youth sports club ,Pudukkottai, Tamilnadu, India were randomly selected as subjects, subjects (N = 45) were divided into three equal groups. Namely, Group I underwent circuit training, group II underwent aquatic training for three days per week for six weeks and Group - III acted as control group was not given any specific training. Each group consists of 15 subjects. The following criterion variable was chosen namely lower body strength endurance. The adjusted post-test means of lower body strength endurance, circuit training group, aquatic training group and control group are 33.46, 34.58 and 27.92 respectively on lower body strength endurance the obtained 'F' ratio of 25.99 for adjusted post-test means is more than the table value of 3.22 for df 2 and 41 required for significance at 0.05 level of confidence on lower body strength endurance. There was a significant difference exists between circuit training group and control group, aquatic training group and control group on lower body strength endurance. And also there was a significant difference exists between aquatic and circuit training group.

Key words: Aquatic training, circuit training, strength endurance

Introduction

Circuit training is a method of physical conditioning that employed both apparatus resistance training and calisthenics conditioning exercise. It provides a means of achieving optimal fitness in a systematized controlled fashion. The intensity and vigor of circuit training are indeed challenging and

enjoyable to the performer. This system produces positive changes in motor performance, general fitness, muscular power endurance and speed. Circuit training stations are generally sequenced in a way to alternate between muscle groups, which allows for adequate recovery. The rest interval between stations should be between thirty-ninety seconds and one-three minutes

between circuits. The load should be increased periodically to ensure progressive over load. In addition, the sequence of exercise should be arranged so that no two consecutive stations consist of exercise involving the same muscle group. Training frequency should be three days per week, with duration of at least 6 weeks. (Shaver 1981). Aquatic training significant improvement of Physiological performance (K.Kamalakkannan et.al. 2010). Aquatic training shows significant improvement in all the selected physical fitness variables (K.Kamalakkannan et.al. 2010). Shallow water walking has show greater improvement in physical fitness variables (K.Kamalakkannan et.al. 2014). Plyometric training in aquatic environment can be effective improvement in endurance (K.Kamalakkannan et.al. 2011). Aquatic training produced positive impacts on the agility and explosive power (K.Kamalakkannan et.al. 2010). Aquatic plyometric training with and without resistance have benefits depending on the type and goal of training (K.Kamalakkannan et.al. 2011). Aquatic training group had no significant changes compared to combined training group in all variables. Also combined training group had no significant changes compared to aquatic training group in all variables (K.Bagavinar & K.Kamalakkannan, 2013). Aquatic training group had no significant reduction than control group in systolic blood pressure and diastolic blood pressure. Also aquatic training group had no significant changes compared to combined training group in all variables (K.Bagavinar & K.Kamalakkannan, 2013).

Methodology

The purpose of the study was to find out the impact of aquatic and land circuit training on lower body strength endurance among athlete to achieve this purpose of the study forty five athletes in

Kavinadu youth sports club, Pudukkottai, Tamilnadu, India were randomly selected as subjects. The selected subjects were divided in to three equal groups of fifteen subjects each. Group I underwent circuit training, group II underwent aquatic training for three days per week for six weeks. Group III acted as control group that did not participate in any special training programme apart from their regular activities as per their curriculum. Aquatic training and circuit training programme three days per week for six weeks and a session on each day with 45 min duration. In training session subjects of experimental groups had fifteen minutes of warm up and fifteen minutes of warm down exercises involving jogging, mobility and stretching exercise.

Statistical Techniques

The following statistical procedures were employed to estimate the Impact of aquatic training and circuit training on selected physical variable among athletes. Analyze of covariance statistical techniques was used to test the adjusted post test means difference among the experimental group. The analysis of covariance on lower body strength endurance of pre and post test scores of experimental group and control group have been analyzed and presented in Table.

Table-1

Analysis of covariance of the data on lower body strength endurance of pre and post tests scores of circuit training groups, aquatic training group and control group.

| test | gro up i | gro up ii | grou p iii | sour ce of varia nce | sum of squa res | d f | mea n squ ares | obtai ned 'f' ratio |
|--------------------------------|-------------|--------------|---------------|-------------------------------|--------------------------|--------|-------------------------|------------------------------|
| Pret est Mea n S.D | 27.2 6 | 27.3 3 | 27.2 0 | Betw een | 0.13 | 2 | 0.07 | 0.01 |
| | 7.40 | 6.93 | 6.78 | Withi n | 2084 .6 | 4 2 | 47.6 8 | |
| Post test Mea | 32.1 3 | 33.9 3 | 27.8 6 | Betw een | 275. 91 | 2 | 137. 95 | 3.41* |

| | | | | | | | | |
|----------------------------------|-----------|-----------|-----------|---------------------------|--------------------|--------|--------------------|------------|
| n | | | | | | | | |
| S.D | 6.71 | 5.01 | 7.16 | Withi n | 1700 .40 | 4 2 | 40.4 8 | |
| Adj uste d Post test | 33.4 6 | 34.5 8 | 27.9 2 | Betw een Withi n | 535. 23 422. | 2 4 | 267. 61 10.2 | 25.99 * |

* Significant at 0.05 level of confidence.

(The table values required for significance at 0.05 level of confidence for 2 and 42 and 2 and 41 are 3.22 respectively). The post-test mean values on lower body strength endurance of circuit training group, aquatic training group and control group are 33.13, 33.93 and 27.86 respectively. The obtained "F" ratio of 3.41 for post test scores is more than the table value of 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on lower body strength endurance. The adjusted post-test means of lower body strength endurance, circuit training group, aquatic training group and control group are 33.46, 34.58 and 27.92 respectively on lower body strength endurance the obtained 'F' ratio of 25.99 for adjusted post-test means is more than the table value of 3.22 for df 2 and 41 required for significance at 0.05 level of confidence on lower body strength endurance. The results of the study indicated that there was a significant difference between the adjusted post-test means of circuit training group, aquatic training group and control group on lower body strength endurance.

Table-1A

The Scheffe's test for the differences between paired means on lower body strength endurance

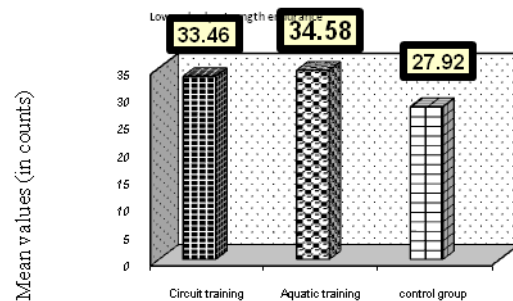
| Circuit Training | Aquatic Training | Control Group | Mean Differences | Confidence Interval Value |
|------------------|------------------|---------------|------------------|---------------------------|
| 33.46 | 34.58 | - | 1.12* | 1.08 |
| 33.46 | - | 27.92 | 5.54* | 1.08 |
| - | 34.58 | 27.92 | 6.66* | 1.08 |

* Significant at 0.05 level of confidence.

Result of lower body strength endurance

The table A shows that the mean difference values between circuit training group, aquatic training group and control group on lower body strength endurance 1.12, 5.54 and 6.66 which greater than the confidence interval value 1.084 required for significance at 0.05 level of confidence.

The results of this study showed that there was a significant difference exists between circuit training group and control group, aquatic training group and control group on lower body strength endurance. And also there was a significant difference exists between aquatic and circuit training group.



The adjusted post –test mean values of circuit training aquatic training and control group on lower body strength endurance

Discussion of findings

In Athletics muscular endurance, flexibility has been over emphasized to gain performance at any level of competition. The finding of study showed that there was significant improvement in lower body strength endurance due to the influence of Aquatic training and circuit training among Athletes.

Finding of the study showed that there was significant improvement in physical variable. Hence the hypothesis was accepted. The findings of Avelar NC (2007) supported that lower-limb muscle endurance

was improved due to the influence of Aquatic training and circuit training.

Tsourlou (2006) aquatic training (AT) program supported that muscle strength, flexibility was improved due to influence of Aquatic training.

Conclusion

From the results of the present study undertaken certain limitations imposed by the experimental conditions, the following conclusions were arrived. The circuit training group and aquatic training group has produced significant improvement on lower body strength endurance greater than control groups. Aquatic training group has significant improvement on lower body strength endurance greater than circuit training group.

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