Effects of Circuit Training Combined with Jump Rope Training on Speed among School

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Abstract

The purpose of study was to find out the effects of circuit training combined with jump rope training on physical fitness variables of school girls. To achieve the purpose of the study, thirty school going girls from different school of Alagappa Sports Foundation at Karaikudi, were selected as subject at random their age group range between 13 to 15 years. The study was formulated as pre and post test random group design, in which thirty subjects were divided into three equal groups. The experimental group-1 (n=10, CT) underwent circuit training, the experimental group-2 (n=10, CT-JRT) underwent circuit training combined with jump rope training and group 3 served as control group (n=10, CG) did not undergo any specific training. In this study, two training programme were adopted as independent variable, i.e., circuit training and circuit training combined with jump rope training. The following physical fitness variables are speed were selected as depended variables. As far as the physical fitness variables concerned all the selected variables were measure by standardized test item. The selected two treatment group's namely circuit training and circuit training combined with jump rope training were performed five days in a week for the period of six weeks, as per the stipulated training program. The selected physical fitness was collected before and after the training period. The collected pre and post data was critically analyzed with apt statistical tool of one-way analysis of co-variance, for observed the significant adjusted post-test mean difference of three groups with respect to each parameter. The Schefft's post hoc test was used to find out pair-wise comparisons between groups with respect to each parameter. To test the hypothesis 0.05 level of significant was fixed in this study.

Keywords: *Circuit training, Jump rope training, Speed*

Introduction

During the early stages of strength training, especially with entry-level athlete almost any strength training method or program will result in strength development to some degree. As the athlete develops a strength foundation, however, the coach should create a specific, periodized strength training program to maximize the athlete's natural abilities. Equally important for coaches to keep in mind is that each athlete has a unique rate of response, reaction, and adaptation to a given method, and therefore, a different rate of improvement. Strength training is a long-term proposition. Athletes do not reach their highest level after four to six weeks from the beginning of the strength training program, but rather during the competitive phase, which is months away from the anatomical adaptation phase.

The goal of the anatomical adaptation phase is to adapt the muscles, and especially their attachments to the bone, progressively to cope more easily with heavier loads during the following training phases. As such, the overall load in training must be increased without athletes experiencing muscle discomfort. The simplest method to consider for the anatomical adaptation is circuit training, mainly because it provides an organized structure and alternates muscle groups. Although circuit training can be used to develop the foundation of strength for the other training phases to come, it can also be used to develop nonspecific cardio respiratory endurance by combining strength and endurance training. Some authors suggest that combining aerobic endurance with strength training during the same phases may seriously compromise the development of maximum strength and power. The claim is that strength training is incompatible with long-distance aerobic training because fast-twitch fibers may adapt to behave like slow-twitch fibers. These studies scientifically validate the theory that planning a long and slow-duration strength and hypertrophy training on the same day will negatively affect adaptation. Short-term adaptation will suffer. However, athletes in sports in which both strength and aerobic endurance are dominant (rowing, kayaking, canoeing, and cross-country skiing) don't have a choice but to train both during the preparatory phase. Some research suggests the opposite: that certain compatibility exists between strength and endurance training performed at the same time.

N. Akilah (2014), conducted study on effect of sports specific endurance circuit training on sprinting performance and leg explosive power of high school male basketball players during competitive. Their research show that sports specific endurance circuit training

group significantly improved sprinting performance and leg explosive power of adolescent male basketball players during competitive season.

Methodology

The purpose of study was to find out the effects of circuit training combined with jump rope training on physical fitness variables of school girls. To achieve the purpose of the study, thirty school going girls from different school of Alagappa Sports Foundation at Karaikudi, were selected as subject at random their age group range between 13 to 15 years. The study was formulated as pre and post test random group design, in which thirty subjects were divided into three equal groups. The experimental group-1 (n=10, CT) underwent circuit training, the experimental group-2 (n=10, CT-JRT) underwent circuit training combined with jump rope training and group 3 served as control group (n=10, CG) did not undergo any specific training. In this study, two training programme were adopted as independent variable, i.e., circuit training and circuit training combined with jump rope training. The following physical fitness variables are speed were selected as depended variables. As far as the physical fitness variables concerned all the selected variables were measure by standardized test item. The selected two treatment group's namely circuit training and circuit training combined with jump rope training were performed five days in a week for the period of six weeks, as per the stipulated training program. The selected physical fitness was collected before and after the training period. The collected pre and post data was critically analyzed with apt statistical tool of one-way analysis of co-variance, for observed the significant adjusted post-test mean difference of three groups with respect to each parameter. The Schefft's post hoc test was used to find out pair-wise comparisons between groups with respect to each parameter. To test the hypothesis 0.05 level of significant was fixed in this study.

Analysis of the Data

Table - I

The Results of Analysis of Covariance on Speed of Different Groups (Scores in Seconds)

Test Conditions		**Group 1 CT**	**Group 2 CT-JRT**	**Group 3 CG**	**SV**	**SS**	**Df**	**MS**	**'F' Ratio**
Pre-test	Mean	6.90	6.83	6.82	B	0.04	2	0.02	0.12
	S.D.	0.46	0.42	0.36	W	4.8	27	0.18	

Post test	Mean	5.91	5.81	6.91	B	7.2	2	3.7	29.17*
	S.D.	0.42	0.29	0.35	W	3.4	27	0.13	
Adjusted post test	Mean	5.87	5.83	6.94	B	7.85	2	3.92	180.5*
					W	0.57	26	0.02	

* Significant at .05 level of confidence. The required tables value for test the significance was 3.35 and 3.37with the df of 2 and 27, 2 and 26.

Results of Speed

The pre-test means and standard deviation on speed scores G1, G2 and G3 were 6.90±0.46, 6.83±0.42 and 6.82±0.36 respectively. The obtained pre-test F value of 0.12 was lesser than the required table F value 3.35. Hence the pre-test means value of circuit training, circuit training combined with jump rope training and control group on speed before start of the respective treatments were found to be insignificant at 0.05 level of confidence for the degrees of freedom 2 and 27. Thus this analysis confirmed that the random assignment of subjects into three groups were successful.

The post-test means and standard deviation on speed of G1, G2 and G3 were 5.91±0.42, 5.81±0.29 and 6.91±0.35 respectively. The obtained post test F value of 29.17 was higher than the required table F value of 3.35. Hence the post test means value of circuit training and circuit training combined with jump rope training on speed were found to be significant at 0.05 level of confidence for the degrees of freedom 2 and 27. The results proved that the selected two training interventions namely circuit training and circuit training combined with jump rope training was produced significant improvement rather than the control group of the sample populations.

The adjusted post test means on speed scores of G1, G2 and G3 were 5.87, 5.83 and 6.94 respectively. The obtained adjusted post test F value of 180.5 was higher than the required table F value of 3.37. Hence the adjusted post test means value of circuit training and circuit training combined with jump rope training on speed were found to be significant at 0.05 level of confidence for the degrees of freedom 2and 26. The results confirm that the selected two training interventions namely circuit training and circuit training combined with jump rope training on speed were produced significant difference among the groups.

In order to find out the superiority effects among the treatment and control groups the Sheaffe's post hoc test were administered. The outcomes of the same are presented in the table II

Table - II

The Results of Scheffe's Post Hoc Test Mean Differences on Speed among Three Groups (Scores in Seconds)

Group 1 CT	Group 2 CT – JRT	Group 3 CG	Mean Differences	Confidence Interval Value
5.87	5.83		0.05	0.211
5.87		6.94	1.06*	0.211
	5.83	6.94	1.11*	0.211

* Significant at .05 level of confidence.

Result of Schefft's post hoc test on speed

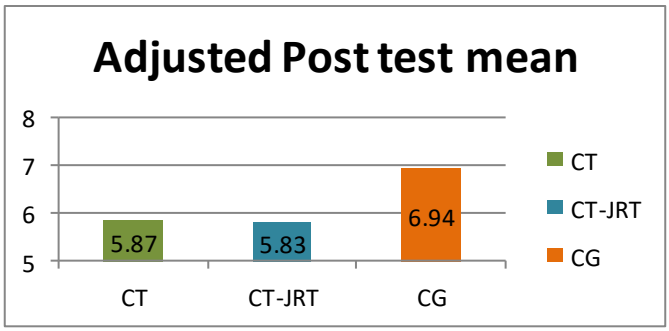
Table II shows the paired mean differences of circuit training, circuit training combined with jump rope training and control group on speed. The paired wise comparisons result as follows.

First comparison: Group 1 and Group 2: The pair wise mean difference of group 1 and group 2 values 0.05 was lesser than the confidential value of 0.211. Hence the first comparison was insignificant. The results of this comparison clearly proved that both training have produced similar effects on speed. **Second comparison: Group 1 and Group 3:** The pair wise mean difference of group 1 and group 3 values 1.06 was higher than the confidential value of 0.211. Hence the second comparison was significant. The results of this comparison clearly proved that circuit training have produced greater improvements on speed, than the control group. **Third comparison: Group 2 and Group 3:** The pair wise mean difference of group 2 and group 3 values 1.11 was higher than the confidential value of 0.211. Hence the third comparison was significant. The results of this comparison clearly proved that circuit training combined with jump rope training have produced greater improvements on speed, than the control group.

The adjusted post test mean deference of experimental and control group value graphically represented in the figure I.

Figure I

The Adjusted Post Test Mean Values of Experimental and Control Groups on Speed Groups (Scores in Seconds)



Conclusions

After analyzing the statistical end results the researcher found that the selected training groups have significantly improved the nature of speed from the base line to post interventions. The pre to post intervention was present as follows. The circuit training group from pre (6.90±0.46) to post (5.91±0.42) and circuit training combined with jump rope training from pre (6.83±0.42) to post (5.81±0.29) have significantly changed the pre to post results. The present study demonstrates an increase in speed performance of 0.01% and 0.01% for circuit training and circuit training combined with jump rope training groups respectively. The result of this study prove that the nature of speed increased significantly over the six weeks training period circuit training and circuit training combined with jump rope training groups when comparing control group. However, the circuit training and circuit training combined with jump rope training would produce similar improvement on speed. The control group did not show any significant changes on speed.

References

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