

Comparable Effects of Isolated and Combined Assisted and Resisted Sprint Training Programmes on Strength Endurance among College Women Athletes

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Abstract

The present study was designed to find out the effects of isolated and combined assisted and resisted sprint training programmes on Strength Endurance among college women athletes. For this purpose sixty (N=60) college female athletes who were studying various colleges affiliated to Bharathidasan University, Tiruchirappalli, Tamilnadu India were selected randomly as subjects. The age of the subjects were ranged between 18-21 years. The subjects were assigned at random into four groups of fifteen each (n=15) namely, Assisted Sprint Training Group (ASTG), Resisted Sprint Training Group (RSTG), Combined Assisted and Resisted Sprint Training Group (ARSTG), and Control Group (CG). Group-I underwent Assisted Sprint Training, Group-II underwent Resisted Sprint Training, Group-III underwent Combined Assisted and Resisted Sprint Training and Group-IV acted as Control. The duration of the training period for all the three experimental groups was restricted to twelve weeks and the number of sessions per week was confined to three in a week. For combined Assisted and Resisted Sprint Training the training period was restricted to alternative weeks for twelve weeks. Strength Endurance was selected as dependent variable and it was assessed by Bent Knee Sit-ups test. All the subjects were tested prior to and immediately after the training for the entire selected variable. The data obtained from the experimental groups before and after the experimental period were statistically analyzed with Analysis of covariance (ANCOVA). Whenever the 'F' ratio for adjusted post test means was found to be significant, the Scheffe's Post hoc test was applied to determine the paired mean differences. The level of confidence was fixed at 0.05 level for all the cases. The results of the study showed that there was a significant difference was found among all the experimental groups namely Assisted Sprint Training Group (ASTG), Resisted Sprint Training Group (RSTG), Combined Assisted and Resisted Sprint Training Group (ARSTG) on Strength Endurance. Further the results of the study showed that Combined Assisted and Resisted Sprint Training Group (ARSTG) was found to be better than the Assisted Sprint Training Group (ASTG), and Resisted Sprint Training Group (RSTG), in Strength Endurance.

Keywords: Assisted Sprint Training, Resisted Sprint Training, Combined Assisted and Resisted Sprint Training, Strength Endurance

Introduction

Sports are structured competitive activities requiring intense physical effort or the use of physically sophisticated abilities by participants driven by intrinsic enjoyment and external rewards. All physical activities that attempt to use, maintain, or enhance physical fitness while also entertaining individuals through informal or organised involvement are considered sports. Since the beginning of time, people have used the word "training" in their speech. It refers to the process of getting ready to do something. This procedure always takes several days, sometimes even months or years. (Bompa, 1997)

Regular physical exercise defined as a specific subset of physical activity maintains and develops physical fitness, health, and wellness. For instance, it has frequently been shown that different types of resistance training have the potential to improve health- and skill-related components of physical fitness (Kraemer et al., 2002).

Assisted and resisted training are specific types of facilitation and overload. They are concepts that are widely used in other types of training such as whole body vibration (facilitation) and weight lifting (overload). Speed of movement can best be attained by practicing speed with lighter weight, where as improved strength can best be attained with a maximum overloading of a muscle.

Sprinting can be defined as the ability to run at maximum speed for a short duration. Maximum running speed is an important factor for success in many sports. Different modalities of training have been employed in the development of maximum running speed. Two commonly used forms of speed training are assisted (or over speed) and resisted sprinting. During assisted sprinting, the athlete runs while being pulled along by some type of device, often an elastic cord or a rope-and-pulley system (Sunilkumar et al., 2020).

Mero and others (1987) found that running at supramaximal speeds resulted in marked increases in horizontal and vertical force production during impact when compared to non-assisted values. Benefit of sprinting under resistance is increased kinaesthetic feedback, allowing the athlete to better improve technique (Korchemy, 1992).

Methodology

For this study sixty (N=60) college female athletes who were studying various affiliated colleges to Bharathidasan University, Tiruchirappalli, Tamilnadu India were selected randomly as subjects. The age of the subjects were ranged between 18-21 years. The subjects were assigned at random into four groups of fifteen each (n=15) namely, Assisted Sprint Training Group (ASTG), Resisted Sprint Training Group (RSTG), Combined Assisted and Resisted Sprint Training Group (CARSTG), and Control Group (CG). Group-I underwent Assisted Sprint Training, Group-II underwent Resisted Sprint Training, Group-III underwent Combined Assisted and Resisted Sprint Training and Group-IV acted as Control. The duration of the training period for all the three experimental groups was restricted to twelve weeks and the number of sessions per week was confined to three in a week. For combined Assisted

and Resisted Sprint Training the training period was restricted to alternative weeks for twelve weeks.

Strength Endurance was selected as dependent variable and it was assessed by Bent Knee Sit-ups Test. All the subjects were tested prior to and immediately after the training for the entire selected variable. The data obtained from the experimental groups before and after the experimental period were statistically analyzed with Analysis of covariance (ANCOVA). Whenever the 'F' ratio for adjusted post test means was found to be significant, the Scheffe's Post hoc test was applied to determine the paired mean differences. The level of confidence was fixed at 0.05 level for all the cases.

Results

The Analysis of covariance (ANCOVA) on Strength Endurance of Experimental Groups and Control group have been analyzed and presented in Table -1.

Table – 1

Analysis of Covariance for Experimental Groups and Control Group on Strength Endurance

Certain Variables	Adjusted Post test Means				Source of Variance	Sum of Squares	df	Mean Squares	'F' Ratio
	ASTG	RSTG	CARSTG	CG					
Pre Test	14.73	14.40	14.20	14.47	Between	2.18	3	0.73	0.18
					With in	228.67	56	4.08	
Post Test	18.20	19.00	21.47	14.80	Between	341.40	3	113.80	18.94*
					With in	336.53	56	6.01	
Adjusted Post Test	18.01	19.03	21.64	14.79	Between	360.22	3	120.07	28.84*
					With in	229.01	55	4.16	

* Significant at.05 level of confidence

Table value for df (3, 56) at 0.05 level = 2.76 Table value for df (3, 55) at 0.05 level = 2.78

(ASTG =Assisted Sprint Training Group, RSTG = Resisted Sprint Training Group, CARSTG= Combined Assisted and Resisted sprint Training Group, CG- Control Group)

Table-1 shows that the pre test mean value of Strength Endurance for ASTG, RSTG, CARSTG and CG are 14.73, 14.40, 14.20 and 14.47 respectively. The obtained F-ratio of 0.18 for the adjusted post test mean is less than the table value of 2.76 for df 3 and 56 required for significance at 0.05 level of confidence. The post test mean value of Strength Endurance for ASTG, RSTG, CARSTG and CG are 18.20, 19.00, 21.47 and 14.80 respectively. The obtained F-ratio of 18.94 for the adjusted

post test mean is less than the table value of 2.76 for df 3 and 56 required for significance at 0.05 level of confidence.

Further the table-1 shows that the adjusted post test mean value of Strength Endurance for ASTG, RSTG, CARSTG and CG are 18.01, 19.03, 21.64 and 14.79 respectively. The obtained F-ratio of 28.84 for the adjusted post test mean is more than the table value of 2.78 for df 3 and 55 required for significance at 0.05 level of confidence.

The results of the study indicate that there are significant differences among the adjusted post test means of experimental groups on the increase of Strength Endurance.

To determine which of the paired means had a significant difference, Scheffe's test was applied as Post hoc test and the results are presented in Table-2.

Table - 2
The Scheffe's test for the differences between the adjusted post tests paired means on Strength Endurance

Certain Variables	Adjusted Post test Means				Mean Difference	Confidence Interval
	ASTG	RSTG	CARSTG	CG		
Strength Endurance	18.01	19.03			1.03	2.15
	18.01		21.64		3.63*	2.15
	18.01			14.79	3.22*	2.15
		19.03	21.64		2.60*	2.15
		19.03		14.79	4.25*	2.15
			21.64	14.79	6.85*	2.15

* Significant at.05 level of confidence

The table-2 shows the pair wise comparison on Strength Endurance of different groups.

- The results indicated that there was significant differences (CI=2.15) were found in ASTG and CARSTG (3.63), ASTG and CG (3.22), RSTG and CARSTG (2.60), RSTG and CG(4.25) & CARSTG and CG(6.85).
- The results indicated that there was no significant differences (CI=2.15) ASTG and RSTG (1.03),

The graphical representation of pre and post assessment means values are represented in the Fig.1. The graphical representation of adjusted post assessment means values are represented in the Fig.2.

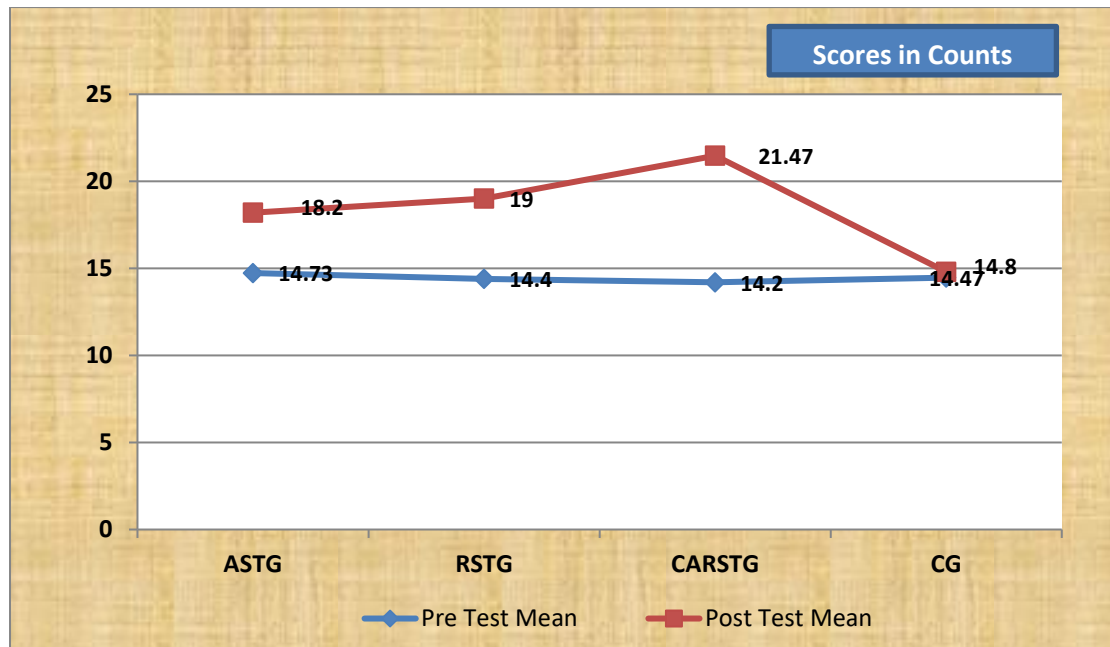


Fig-1: Pre and Post Test Means Diagram on Strength Endurance

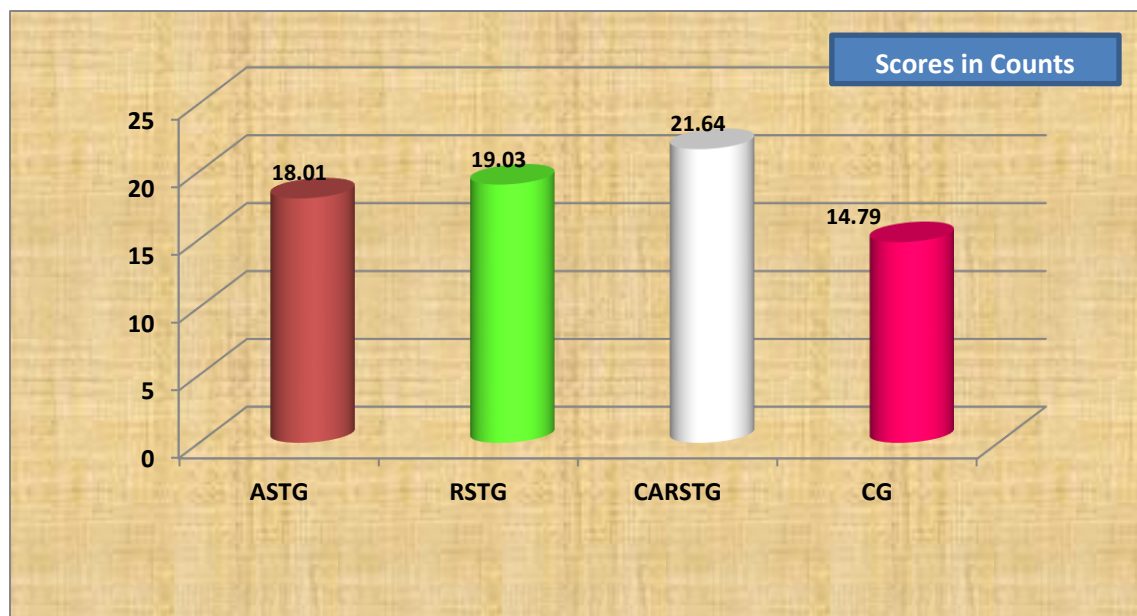


Fig-2: Adjusted Post Test Means Diagram on Strength Endurance**CONCLUSIONS**

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

1. Significant differences in achievement were found between AST group, RST group, CARST group and CG in Strength Endurance.
2. The experimental groups namely, AST group, RST group, and CARST group had significantly improved in Strength Endurance.
3. The CARST group was found to be better than the AST group, RST group and Control group in increasing Strength Endurance.

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