ISO 9001 - 2015

ISSN 2349 - 4891

Monthly

IJRRAS

IF
4.665

Volume 4,Issue 6, June 2017

International Journal of
Recent Research and Applied Studies

SURRAGH PUBLICATIONS

ISSN: 2349 - 4891

International
Journal of Recent Research and Applied Studies
(Multidisciplinary Open Access Refereed e-Journal)

Effect of Explosive type Strength Training on Selected Physical and Physiological Parameters of Soccer Players

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Received 02th May 2017, Accepted 1st June 2017

Abstract

To achieve this purpose of the study, thirty male soccer players were selected randomly from the Selvam College of Physical Education, Namakkal, Tamilnadu, India in the age group of 18 to 20 years. The selected subjects were divided into two groups. Group-I underwent explosive type of strength training programme for 8 weeks and group-II acted as control. The pretest and post-test data of the two groups were statistically examined separately for each variable by applying analysis of covariance to find out the significant difference if any. Scheffe's Post Hoc test was not applied, since only two groups are involved when 'F' ratio for adjusted post-test means was found to be significant.

Keywords: Leg Strength, Muscular Strength Endurance, Explosive Power, Resting pulse rate, Vital capacity.

Introduction

Sports science has made rapid progress in the last few decades. Theory and the methods of sports training was a subject of central importance among the various disciplines and it has developed rapidly. Sports performance can be enhanced through training and competition. The recent trend is to improve the physical fitness standards through scientific and systematic training. In a present world of sports, the physical fitness factors have been regarded as one of the important measures for achieving elite levels of sports performance. Sports training are a basic preparation of the sports for better performance through physical exercise. Trainings are meant for the improvement of specific physical and motor fitness qualities. The determination of performance structure is a very difficult task and till now sports scientists and coaches have not been able to satisfactorily tackle this task. A systematic and integrated effort by the various training scientists in class co-operation with the coaches is needed for effectively meeting this challenge. A beginning has been made in this direction and after some years perhaps, we would be in a position to determine satisfactorily the structure of performance in various sports. This would decidedly have a positive effort on better and systematic formulation of the training process. In today's age of scientific knowledge man is making rapid progress in all walks of life and it is true in the area of games and sports. Also scientific knowledge has revolutionalized the standards of human performance in sports disciplines

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The athletes are now trained on scientific lines and using highly sophisticated technology for top performance in their specific sports to get optimum performance with minimum expenditure of energy and time.

Methodology

The purpose of the study was to find out the effect of explosive type strength training on selected physical and physiological parameters of soccer players. For the purpose of the study thirty male soccer players from the Selvam College of Physical Education, Namakkal, Tamilnadu, India were selected randomly in the age group of eighteen to twenty years, and classified them into two equal groups to form a control group and an experimental group.

Training Programme

The subjects underwent explosive type strength training progamme for three days per week for eight weeks. All the subjects involved in the training programme were questioned about their status throughout the training period. None of them reported any injuries. However, muscles soreness was reported in the early weeks, and it subsided later. Attendance was taken before the commencement of each training session. All the subjects were present for more than 97% of the total training sessions. The elastic strength training exercises given to the experimental group were galloping, double leg vertical jump, bounding, hopping, depth jumps, lateral jumps, tuck jumps respectively.

Statistical Techniques

The data collected from two groups prior to and after experimentation on selected physical and physiological parameters, were statistically examined for significant differences, if any, applying the analysis of

covariance (ANCOVA) with the help of SPSS package.

Whenever the 'F' ratio for adjusted posttest mean was found to be significant, the Scheffe's test has to applied as Post Hoc test

Results of the Study

Table 1
Analysis of covariance on leg strength of experimental and control groups

	Explosive Type Strength Training Group	**Control Group**	**Source of variance**	**Sum of Squares**	**df**	**Mean squares**	**Obtained 'F' ratio**
Pretest Mean SD	94.87	94.62	Between	8.64	1	8.64	0.03
	12.29	11.28	Within	9396.87	28	335.60	
Posttest Mean SD	105.31	94.93	Between	2712.04	1	2712.O4	15.23
	11.68	10.78	Within	4985.92	28	178.07	
Adjusted Posttest Mean	103.59	94.89	Between	2846.83	1	2846.83	25.93
			Within	2963.79	27	109.77	

The required table value for significance at 0.05 level of confidence with degrees of freedom 1 and 27 is 4.21 and degree of freedom 1 and 28 is 4.20.

Table 1 shows that the pre test means of leg strength of explosive type strength training and control groups are 94.87 and 94.62 respectively. The obtained 'F' ratio value of 0.03 for pre test means on leg strength is lesser than the table value of 4.20 for significance at 0.05 level of confidence with degrees of freedom 1 and 28. The post-test means on leg strength of explosive type strength training and control groups are 105.31 and 94.93 respectively. The obtained 'F' ratio value of 15.23 for post-test data on leg strength is greater than the required table value of 4.20 for significance at 0.05 level of confidence with degrees of freedom 1 and 28. The adjusted post-test means on leg strength of explosive type strength training and control groups are 103.59 and 94.89 respectively. The obtained 'F' ratio value of 25.93 of adjusted post-test data on leg strength is greater than the table value of 4.21 required for significance at 0.05 level of confidence.

Table 2
Analysis of covariance on muscular strength endurance of experimental and control groups

	Explosive Type Strength Training Group	**Control Group**	**Source of variance**	**Sum of Squares**	**df**	**Mean squares**	**Obtained 'F' ratio**
Pretest Mean SD	24.20	23.67	Between	71.63	1	71.63	2.51
	3.03	2.38	Within	797.73	28	28.49	
Posttest Mean SD	35.33	25.13	Between	504.30	1	504.30	36.67
	2.45	3.64	Within	385.07	28	13.75	
Adjusted Posttest Mean	33.73	24.88	Between	223.72	1	223.72	89.39
			Within	67.57	27	2.503	

The required table value for significance at 0.05 level of confidence with degrees of freedom 1 and 27 is 4.21 and degree of freedom 1 and 28 is 4.20.

Table 2 shows that the pre test means of muscular strength endurance of explosive type strength training and control group are 24.20 and 23.67 respectively. The obtained 'F' ratio value of 2.51 for pre test means on muscular strength endurance is lesser than the required table value of 4.20 for significance at 0.05 level of confidence with degrees of freedom 1 and 28.

Table 3
Analysis of covariance on explosive power of experimental and control groups

	Explosive Type Strength Training Group	**Control Group**	**Source of variance**	**Sum of Squares**	**df**	**Mean squares**	**Obtained 'F' ratio**
Pretest Mean	168.58	168.26	Between	1.11	1	0.55	0.09
SD	2.68	1.78	Within	270.30	28	6.43	
Posttest Mean	177.54	169.28	Between	876.83	1	438.42	31.81
SD	3.71	2.18	Within	463.14	28	11.02	
Adjusted Posttest Mean	177.31	169.43	Between	831.54	1	332.62	189.88
			Within	57.46	27	1.75	

The required table value for significance at 0.05 level of confidence with degrees of freedom 1 and 27 is 4.21 and degree of freedom 1 and 28 is 4.20.

Table 3 shows that the pre test means of explosive power of explosive type strength training group and control group are 168.58 and 168.26 respectively. The obtained 'F' ratio value of 0.09 for pre test means on explosive power is less than the required table value of 4.20 for significance at 0.05 level of confidence with degrees of freedom 1 and 28. The post-test means on explosive power of explosive type strength training group and control group are 177.54 and 169.28 respectively. The obtained 'F' ratio value of 31.81 for post-test data on explosive power is greater than the required table value of 4.20 for significance at 0.05 level of confidence with degrees of freedom 1 and 28. The adjusted post-test means on explosive power of explosive type strength training group and control group are 177.31 and 169.43 respectively. The obtained 'F' ratio value of 189.88 of adjusted post-test data on explosive power is greater than the table value of 4.21 required for significance at 0.05 level of confidence with degrees of freedom 1 and 27.

Table 4
Analysis of covariance on resting pulse rate of explosive type strength training and control groups

	Explosive Type Strength Training group	**Control group**	**Source of variance**	**Sum of squares**	**df**	**Mean squares**	**'F' ratio**
Pretest Mean	68.42	68.63	Between	27.24	1	27.24	1.84
SD	3.97	4.02	Within	413.56	28	14.77	
Posttest Mean	63.15	67.98	Between	184.72	1	184.72	14.91*
SD	3.89	3.76	Within	347.02	28	12.39	
Adjusted Posttest Mean	64.38	68.23	Between	43.89	1	43.89	29.86*
			Within	39.82	27	1.47	

The required table value for significance at 0.05 level of confidence with degrees of freedom 1 and 27 is 4.21 and degree of freedom 1 and 28 is 4.20.

Table 4 shows that the pre test means of resting pulse rate of explosive type strength training and control group are 68.42 and 68.63 respectively. The obtained 'F' ratio value of 1.84 for pre test means on resting pulse rate is lesser than the required table value of 4.20 for significance at 0.05 level of confidence with degrees of freedom 1 and 28. The post-test means on resting pulse rate of explosive type strength training and control groups are 63.15 and 67.98 respectively. The obtained 'F' ratio value of 14.91 for post-test data on resting pulse

rate is greater than the required table value of 4.20 for significance at 0.05 level of confidence with degrees of freedom 1 and 28. The adjusted post-test means on resting pulse rate of explosive type strength training and control groups are 64.38 and 68.23 respectively. The obtained 'F' ratio value of 29.86 of adjusted post-test data on resting pulse rate is greater than the table value of 4.21 required for significance at 0.05 level of confidence with degrees of freedom 1 and 27.

Table 5
Analysis of covariance on vital capacity of explosive type strength training and control groups

	Explosive Type Strength Training group	**Control group**	**Source of variance**	**Sum of squares**	**df**	**Mean squares**	**'F' ratio**
Pretest Mean SD	2673.84	2665.93	Between	25.41	1	25.41	0.02
	58.67	60.98	Within	32512.5	28	1161.17	
Posttest Mean SD	2965.12	2681.24	Between	81431.67	1	81431.67	43.67
	62.41	49.23	Within	52215.74	28	1864.85	
Adjusted Posttest Mean	2883.52	2674.43	Between	82443.58	1	82443.58	47.55
			Within	46813.78	27	1733.84	

The required table value for significance at 0.05 level of confidence with degrees of freedom 1 and 27 is 4.21 and degree of freedom 1 and 28 is 4.20.

Table 5 shows that the pre test means of vital capacity of explosive type strength training and control group are 2673.84 and 2665.93 respectively. The obtained 'F' ratio value of 0.02 for pre test means on vital capacity is lesser than the required table value of 4.20 for significance at 0.05 level of confidence with degrees of freedom 1 and 28. The post-test means on vital capacity of explosive type strength training and control groups are 2965.12 and 2681.24 respectively. The obtained 'F' ratio value of 43.67 for post-test data on vital capacity is greater than the required table value of 4.20 for significance at 0.05 level of confidence with degrees of freedom 1 and 28. The adjusted post-test means on vital capacity of explosive type strength training and control groups are 2883.52 and 2674.43 respectively. The obtained 'F' ratio value of 47.55 of adjusted post-test data on vital capacity is greater than the table value of 4.21 required for significance at 0.05 level of confidence with degrees of freedom 1 and 27.

Conclusions

It was concluded that due to the effect of eight weeks of explosive type strength training, the selected physical (leg strength, muscular strength endurance and explosive power) and physiological parameters (resting pulse rate and vital capacity) of soccer players have significantly improved.

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