

**EFFECT OF CARDIO RESPIRATORY TRAINING AND CORE STRENGTH
TRAINING ON SELECTED PHYSICAL AND PHYSIOLOGICAL VARIABLES
AMONG COLLEGE FOOTBALL PLAYERS**

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Abstract

'Cardio' refers to the heart and 'Respiratory' refers to the lungs. In other words, the referent is the circulatory system for oxygen that is taken into the blood through the lungs. Cardio-respiratory fitness measure helps to your body's circulatory and respiratory system how well it is able to transport oxygen to your muscles during prolonged exercise and also of how well your muscles are able to absorb and use the oxygen, once it has been delivered, to generate adenosine triphosphate (ATP) energy via cellular respiration (cellular respiration is a chemical process in your body's cells that converts the energy stored in the food you eat into the ATP form of energy that is recruited for use by your muscles). Essentially, your cardio respiratory fitness level is a measure of the strength of your aerobic energy system. If you haven't already read the exercise energy systems (EES) article you can do so to get a better understanding of what ATP is, what cellular respiration and what the aerobic energy system. The purpose of the study was to investigate the effect of cardio respiratory training and core strength training on selected physical and physiological variables among college football players. To achieve the purpose of the present study 30 men students were selected as samples from Adikavi Nannaya University, Andhra Pradesh, India. The age group is between 18 to 25 years. The selected subjects were divided in to three equal groups namely Cardio Respiratory Training group I (n=10), Core Strength Training group II (n=10) and control group III (n=10). The group I, Cardio Respiratory training and group II, Core Strength Training for three days per week for six weeks, whereas the group III, acted as control who maintained their daily routine activities and no special training was given to them. The following physical and physiological variables namely Speed, Muscular Endurance, Cardio Respiratory Endurance, Resting Heart Rate and Breath Holding Time

were selected as criterion variables. The measured by using 50 Yards Dash, Sit-Ups, Cooper's Test, Stopwatch and Manual is used. The collected data were analyzed by using analysis of covariance to find out the significant difference, among the experimental and control groups whenever the F-ratio for ANCOVA was found significant, the Scheffe's post hoc test was used as post hoc test to find the paired mean difference. The results were tested at 0.05 level of confidence. It was concluded that there was a significant improvement on cardio respiratory endurance due to and core strength training when compared to the control group among college football players.

Keywords: Speed and Muscular Endurance

Introduction

The core region consists of far more than just the abdominal muscles. In fact core strength training aims to target all the muscles groups that stabilize the spine and pelvis. It's these muscle groups that are critical for the transfer of energy from large to small body parts during sports activities. There isn't really a technical definition for core strength training, but I consider it to be a program that includes components of balance, stability, abdominal, lower back work and all the muscles of the trunk. A true core strength training program not only uses your abs but also activates all the muscles stabilizing the spine, hips and pelvis.

Methodology

To achieve the purpose of the study, thirty men football players from Adikavi Nannaya University, Andhra Pradesh, India were selected as subjects at random and their age ranged between 18 to 25 years. The selected subjects were divided in to three equal groups namely Cardio Respiratory Training group I (n=10), Core Strength Training group II (n=10) and control group III (n=10). The group I, Cardio Respiratory Training and group II, Core Strength Training for three days per week for six weeks, whereas the group III, acted as control who maintained their daily routine activities and no special training was given to them. All the subjects involved in this study were carefully monitored throughout the training programme to be away from injuries. The scientific method was used to assess the dependent variable is Speed, Muscular Endurance, Cardio Respiratory Endurance, Resting Heart Rate and Breath Holding Time test it was recorded as a pre-test and posttest. The collected data were analyzed by using analysis of covariance to find the significant difference among the experimental and control groups, whenever the F-ratio for ANCOVA was found significant, the Scheffe's post hoc test was used to find the paired mean difference. In all the cases 0.05 levels was fixed as confidence level.

TABLE – 1

CARDIO RESPIRATORY TRAINING SCHEDULE (GROUP – I)

I & II WEEK			III & IV WEEK			V & VI WEEK		
Day	Duration	Intensity	Day	Duration	Intensity	Day	Duration	Intensity
Mon	40 Mints	50%	Mon	40 Mints	60%	Mon	40 Mints	70%
Wed	40 Mints	50%	Wed	40 Mints	60%	Wed	40 Mints	70%
Fri	40 Mints	50%	Fri	40 Mints	60%	Fri	40 Mints	70%

TABLE – 2

CORE STRENGTH TRAINING SCHEDULE (GROUP – II)

I & II WEEK			III & IV WEEK			V & VI WEEK		
Day	Duration	One Station	Day	Duration	One Station	Day	Duration	One Station
Mon	40 Mints	45 Sec	Mon	40 Mints	45 Sec	Mon	40 Mints	45 Sec
Wed	40 Mints	45 Sec	Wed	40 Mints	45 Sec	Wed	40 Mints	45 Sec
Fri	40 Mints	45 Sec	Fri	40 Mints	45 Sec	Fri	40 Mints	45 Sec

TABLE – 3

ANALYSIS OF CO-VARIANCE FOR THE PRE, POST AND ADJUSTED POST TEST MEAN VALUES FOR CARDIO RESPIRATORY TRAINING GROUP, CORE STRENGTH TRAINING GROUP AND CONTROL GROUP ON SPEED

Test	Cardio Respiratory Training Group	Core Strength Training Group	Control Group	Source of Variance	Sum of square	df	Mean Square	'F' ratio	Table Value
Pre Test Mean	7.64	7.54	7.73	Between	0.19	2	0.10	1.47	3.35
				Within	1.77	27	0.07		
Post Test Mean	7.35	7.43	7.74	Between	0.86	2	0.43	4.93*	3.35
				Within	2.34	27	0.09		
Adj Post Test Mean	7.35	7.41	7.75	Between	0.89	2	0.44	5.00*	3.37
				Within	2.31	26	0.04		

*Significant at 0.05 level of confidence

The table - 3 showed that the pre test mean values on Speed of cardio respiratory training group, core strength training group and control group are 7.64, 7.54 and 7.73 respectively. The obtained 'F' ratio 1.47 for pre test mean value was less than the table value 3.35 for df 2 and 27 required for significance at 0.05 level of confidence on speed. The post test mean values on speed of cardio respiratory training group, core strength training group and control group are 7.35, 7.43 and 7.74 respectively. The obtained 'F' ratio 4.93 for post test mean value was greater

than the table value 3.35 for df 2 and 27 required for significance at 0.05 level of confidence on speed. The Adjusted post test means of cardio respiratory training group, core strength training group and control group are 7.35, 7.41 and 7.75 respectively. The obtained 'F' ratio 5.00 for adjusted post test mean value was greater than the table value 3.37 for df 2 and 26 required for significance at 0.05 level of confidence on speed. Since the obtained 'F' ratio value was significant further to find out the paired mean difference, the Scheffe's post hoc test was employed and presented in table - 4

TABLE - 4

THE SCHEFFE'S POST HOC TEST FOR THE DIFFERENCE BETWEEN PAIRED MEANS ON SPEED

Cardio Respiratory Training Group	Core Strength Training Group	Control Group	MD	CI
7.35		7.75	0.40*	0.32
	7.41	7.75	0.34*	0.32
7.35	7.41		0.06	0.32

*Significance at 0.05 level of confidence

The table - 4 shows that the adjusted post-test mean difference in speed between cardio respiratory training group and control group is 0.40 it is significant at 0.05 level of confidence and proved there was a significant improvement. Core strength training group and control group is 0.34 it is significant at 0.05 level of confidence and proved there was a significant improvement. Hence, there was significant difference between control and experimental groups in speed among men football Players. However, the mean difference between the two experimental groups was 0.06 which was not significant at 0.05 level of confidence. It may be concluded from the results that there was no significant difference between adjusted post means of cardio respiratory training group and core strength training group. Statistically significant difference existed between the core strength training group and control group. The results of the study showed that there were a significant difference between cardio respiratory training group and control group, core strength training group and control group on speed.

TABLE - 5

ANALYSIS OF CO-VARIANCE FOR THE PRE, POST AND ADJUSTED POST TEST MEAN VALUES FOR CARDIO RESPIRATORY TRAINING GROUP, CORE STRENGTH TRAINING GROUP AND CONTROL GROUP ON MUSCULAR ENDURANCE

Test	Cardio Respiratory Training	Core Strength Training	Control Group	Source of	Sum of	df	Mean Square	'F' ratio	Table Value
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	Group	Group		Variance	square				
Pre Test Mean	23.60	22.70	24.20	Between	11.40	2	5.70	0.79	3.35
				Within	194.10	27	7.19		
Post Test Mean	25.80	26.30	22.80	Between	71.67	2	35.83	10.15*	3.35
				Within	95.30	27	3.53		
Adjusted Post Test Mean	25.79	26.39	22.72	Between	73.99	2	36.99	10.35*	3.37
				Within	92.92	26	3.57		

*Significant at 0.05 level of confidence

The table - 5 showed that the pre test mean values on muscular endurance of cardio respiratory training group, core strength training group and control group are 23.60, 22.70 and 24.20 respectively. The obtained 'F' ratio 0.79 for pre test mean was less than the table value 3.35 for df 2 and 27 required for significance at 0.05 level of confidence on muscular endurance. The post test mean values on muscular endurance of cardio respiratory training group, core strength training group and control group are 25.80, 26.30 and 22.80 respectively. The obtained 'F' ratio 10.15 for post test mean was greater than the table value 3.35 for df 2 and 27 required for significance at 0.05 level of confidence on muscular endurance. The Adjusted post test means of cardio respiratory training group, core strength training group and control group are 25.79, 26.39 and 22.72 respectively. The obtained 'F' ratio 10.35 for adjusted post test mean was greater than the table value 3.37 for df 2 and 26 required for significance at 0.05 level of confidence on muscular endurance. Since the obtained 'F' ratio value was significant further to find out the paired mean difference, the Scheffe's post hoc test was employed and presented in table – 6.

TABLE - 6

THE SCHEFFE'S POST HOC TEST FOR THE DIFFERENCE BETWEEN PAIRED MEANS ON MUSCULAR ENDURANCE

Cardio Respiratory Training Group	Core Strength Training Group	Control Group	MD	CI
25.78		22.72	3.06*	2.18
	26.38	22.72	3.66*	2.18
25.78	26.38		0.06	2.18

*Significant at 0.05 level of confidence

The table - 6 shows that the adjusted post-test mean difference in muscular endurance between cardio respiratory training group and control group is 3.06 it is significant at 0.05 level of confidence and proved there was a significant improvement. Core strength training group and control group is 3.66 it is significant at 0.05 level of confidence and proved there was a

significant improvement. Hence, there was significant difference between control and experimental groups in muscular endurance among men football Players. However, the mean difference between the two experimental groups was 0.06 which were not significant at 0.05 level of confidence. It may be concluded from the results that there was significant difference between adjusted post means of cardio respiratory training group and core strength training group. Statistically significant difference existed between the core strength training group and the control group. The results of the study showed that there was a significant difference between cardio respiratory training group and control group, core strength training group and control group on muscular endurance.

Conclusions

Based on the research findings the following conclusions were drawn: The Cardio respiratory training and core strength training group has achieved significant positive improvement on physical and physiological variables when compared to the control group. The control group had not shown significant changes in any of the selected variables. The cardio respiratory training and core strength training group has achieved significant positive improvement on physical and physiological variables among college football players.

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