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## Influence of Combinations of Complex Training and Aerobic Training on Speed and Cardio Respiratory Endurance of School Volleyball Players

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### **Abstract:**

*The purpose of this study was to find out the influence of combinations of complex training and aerobic training on the speed and cardio respiratory endurance of school volleyball players. Eighty untrained school students (mean age = 13.5 +/- 2.5 yr) started in one of the following groups: complex training [CT, N = 20 and AT, N = 20, CCAT, N = 20, or a control group (CON, N = 20). Training took place on three alternating days per week for 12 weeks. Assessments of speed, cardio respiratory endurance performance, (40 yards dash and 9 minute run and walk test) were determined by pre-training (T1), and after 12 weeks of post-training. Results of the study were: (approximately 11%) in all training groups and speed and cardio respiratory endurance increased at T2 (approximately 3%) only in CCTA. Finally, he concluded that training combination of complex training and aerobic training improved the speed and cardio respiratory endurance.*

**Key words:** speed, cardio respiratory endurance, CCAT = combination of complex and aerobic training, CT = complex training, AT = aerobic training

### **1. Introduction**

It is a highly effective form of physical training that combines both resistance strength training and plyometric explosive power training. The idea is to use the combination of resistance and plyometric exercises to superbly engage the nervous system and activate more fibres. Complex training describes a power-developing workout that combines weights and plyometric exercises. Sports offer many opportunities for people to make the best use of their abilities, to become part of a cooperative team effort, to experience the joy, and sometimes the misery, of winning and losing. In ancient times, our ancestors exhibited extraordinary talents in terms of physical activity. Accompanied by fierce competition, the arena of sports and games has evolved to assume professional dimension. Somehow or other, irrespective of age, the human race is involved in different kinds of sports either for recreation or for competition. In the present world, Sports have become extremely competitive. It is not mere participation or practice that makes an individual victorious. Qualitative sports life is affected by various factors like physiology, biomechanics, sports training, sports medicine, sociology and coaching, computer application and psychology and so on.

### **2. Methods**

To achieve the purpose of the study, one hundred and ten players were selected as samples from Govt. school, Dindigul in teams of the qualified for Dindigul district games. To ensure the quality in selection of samples, as a criterion overall playing ability was considered. The overall playing ability of selected samples was assessed by a team of three experts, including the investigator, using ten point rating scale of the one hundred and ten volleyball players, eighty players were selected excluding the players who scored lower and upper quarter. Finally 80 male volleyball players were selected as subjects for the present study. The selected subjects (N=80) were divided into four groups equally of which experimental Group I underwent Complex Training (CT) Group II underwent aerobic training (AT), Group III underwent a combination of Complex Training and aerobic training (CCAT) and Group IV Control Group (CG) underwent traditional training. All the four groups were treated with their respective training for one and a half hours per day for three days a week for a period of twelve weeks.

3. Result

Variables	Mean	Std. Deviation	M.D	Std. Error Mean	't' ratio
Speed pre-test	9.2630	.6024	.3440	0.024	13.99
Speed Post-test	8.9190	.6147			
CRE Pre-test	503.2500	68.6385	72.5000	08.04	9.01
CRE post-test	575.7500	85.7057			

Table 1: Complex Training Group  
 \* Significant At 0.05 Level, (Table Value 2.09)

Variables	Mean	Std. Deviation	M.D	Std. Error Mean	't' ratio
Speed pre-test	9.2860	.4396	.1870	0.0097	19.01
Speed Post-test	9.0990	.4407			
CRE Pre-test	504.0000	110.1506	.1870	14.53	2.44
CRE post-test	539.5500	146.2278			

Table 2: Aerobic Training Group  
 \* Significant AT 0.05 LEVEL, (Table VALUE 2.09)

Variables	Mean	Std. Deviation	M.D	Std. Error Mean	't' ratio
Speed pre-test	9.2595	.6323	0.40	0.059	6.84*
Speed Post-test	8.8520	.5639			
CRE Pre-test	503.5000	74.64	96.00	3.50	27.35*
CRE post-test	599.5000	77.42			

Table 3: Combination of Complex and Aerobic Training Group  
 \* Significant At 0.05 Level (Table Value 2.09)

Variables	Mean	Std. Deviation	M.D	Std. Error Mean	't' ratio
Speed pre-test	9.2595	.5124	0.010	0.0048	2.05 *
Speed Post-test	9.2495	.5175			
CRE Pre-test	502.5000	55.9017	1.50	0.81	1.83 *
CRE post-test	504.0000	55.9511			

Table 4; Control Group  
 \* Significant At 0.05 Level (Table Value 2.09)

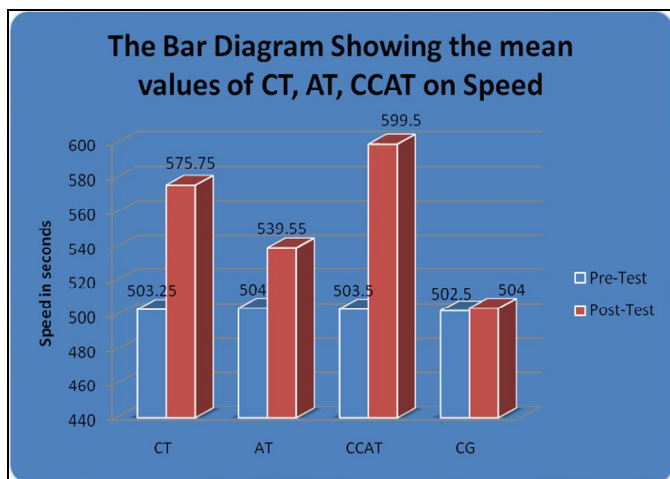


Figure 1

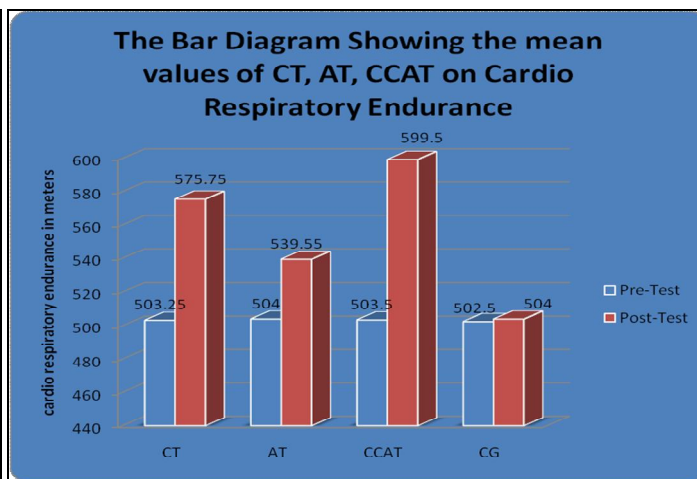


Figure 2

		Sum of Squares	Df	Mean Square	F	Sig.
SPEED PRE-TEST	Between Groups	0.0097	3	0.0032	.011	.998
	Within Groups	23.150	76	.305		
SPEEDPOST TEST	Between Groups	1.939	3	.646	2.233	.091
	Within Groups	22.000	76	.289		
CRE PRE-TEST	Between Groups	23.438	3	7.813	.001	1.000
	Within Groups	485273.750	76	6385.181		
CRE POST TEST	Between Groups	105003.100	3	35001.033	3.699*	.015
	Within Groups	719207.700	76	9463.259		

Table 5: Analysis of Variance on Pre and Post Test of CT, AT, CCAT On Speed and Cardio Respiratory Endurance of School Volleyball Players  
\*Significant at 0.05 level. (Table value is 2.73)

Table – 5 reveals the obtained ‘F’ values on pre-test means among the four groups. The obtained ‘F’ ratios were: 0.998(speed), 1.00 (cardio respiratory endurance), it failed to reach the table value of 2.73. The ‘F’ values observed on these variables were not significant since it fails to reach the critical ratio of 2.73 for degree of freedom 3, 76 at 0.05 levels. Based on the results it is inferred that the mean differences among the four groups on speed and cardio respiratory endurance used in this study before the start of the respective treatments are found to be insignificant. Thus this analysis confirms that the random assignment of subjects into four groups was successful.

Table – 5 reveals the obtained ‘F’ values on pre-test means among the four groups. The obtained ‘F’ ratios were: 2.23 (speed), 3.69 (cardio respiratory endurance). Since the observed F- values on post-test means among the groups on cardio respiratory endurance were highly significant but speed was not significant as the value of the required table value 2.73. So the investigator found the result for anacova on speed.

Variables	Source of variance	Sum of Squares	Df	Mean Square	F
Speed	Between group	1.893	3	.631	30.734*
	Within group	1.540	75	0.020	
Cardio Respiratory Endurance	Between group	103323.665	3	34441.222	25.348*
	Within group	101903.250	75	1358.710	

*Table 6: Analysis of Covariance on Adjusted Post Test of CT, AT, CCAT On Speed and Cardio Respiratory Endurance of School Volleyball Players*

The F-ratio obtained from testing the adjusted post-test means among the four groups on speed and cardio respiratory endurance are shown in table. The obtained 'F' values were: 37.73 (speed), 25.34 (cardio respiratory endurance). The observed F-values on adjusted post-test means among the groups of complex training (CT, Group - I), Aerobic training (AT, Group - II), Combination of complex training and aerobic training (CCAT, Group-III and Control Group (CG, Group – IV) on speed and cardio respiratory endurance were found to be higher than the required critical value 2.73 at 0.05 level of confidence for df3, 75. It is concluded that there is a significant mean difference among the four treatment groups in developing the speed and cardio respiratory endurance. The results of the same are presented in the table

#### 4. Results

##### 4.1. Result of the Study

- In the present study, the complex training showed the significant improvement on speed and cardio respiratory endurance of school volleyball players.
- In the present study, the aerobic training showed the significant improvement on speed and cardio respiratory endurance of school volleyball players
- In the present study, the combination of complex training and aerobic training showed the significant improvement on speed and cardio respiratory endurance of school volleyball players
- In the present study, the combination of complex training and aerobic training showed the significant improvement on speed and cardio respiratory endurance better than the complex training, aerobic training and control group of school volleyball players.
- In the present study, the complex training showed the significant improvement on speed and cardio respiratory endurance better than the aerobic training and control group of school volleyball players.
- In the present study the aerobic training showed the significant improvement on speed and cardio respiratory endurance better than the control group of school volleyball players.

#### 5. Conclusion

This present study combination of complex training and aerobic training showed the significantly better improvement on speed and cardio respiratory endurance than the complex training, aerobic training and control group of school volleyball players.

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