Research Paper

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Effect of Specific Preparatory Training on Selected Physiological Variables of Inter Collegiate Football Players of Various Positions

Physical Education

KEYWORDS : Preparatory Training, Vital Capacity, 12 min run/walk , One Way Repeated Anova. Ancova, Scheffe's post hoc test.

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ABSTRACT

The purpose of this study is to find out the effects of specific preparatory training on selected physiological variables of inter collegiate football players in various playing positions. To achieve this purpose total subjects twenty four intercollegiate college men-football-players (8 forward 8 mid fielder, 8 defenders) from faculty of general and adapted physical education and yoga, Maruthi college of physical education and Sri Rama Krishna Mission college of arts and science, colleges in Coimbatore, were selected as subjects by applying the random sampling techniques. The subjects selected into their position wise namely forward, midfield and defender position each group consists of eight subjects. The subject's age ranged from 17 to 28 years and they formed a true random group design. The selected criterion physiological variables were namely vital capacity and cardio respiratory endurance. The vital capacity was measured by wet spiro meter and cardio respiratory endurance was measured by 12 min/run walk test. The training period consists of twelve weeks Monday to Friday 5 pm to 6 pm. The data were collected pre, mid and post tests were conducted initial and middle and end of training periods. After the training, the collected data were analyzed by applying the one way repeated measures (ANOVA) test. If obtained 'F' was significant new mans kuel test was used to significant difference treatment means pre, mid and post means. Analysis of covariance (ANCOVA) was applied to determine the significant difference among the three groups. If obtained 'F' was significant Scheffe's post hoc test will be used. In all the cases 0.05 was fixed level of confidence. The results of the study shows that there is significant improvement in vital capacity, cardio respiratory endurance due to effect of preparatory training in forward position, mid field position and defender position inter collegiate football players.

INTRODUCTION

The word 'training has been a part of human language since ancient times. It denotes the process of preparation for some task. This process invariably extends over a number of days, even months and years. The term training is widely used in sports. (**Hardayal Singh, 1997**). Preparatory training is a must for regaining the previous training state. To condition the sportsman to take higher training loads during the next phases of preparatory and competition periods. To develop those factors which form the basis for the specific factors of performance. This phase is characterized by a sharp increase in training volume whereas there is very less increase in training intensity. General exercises are used predominantly. Very few competitions are there is this phase. Cardio means heart, vascular means function of tissue and endurance means capacity. Cardio respiratory endurance refers to the ability of the circulatory system to provide oxygen to the cells to support the oxidative energy of the body besides removing the waste products of metabolism. The purpose of the study was to find out the effect of specific preparatory training on selected physiological variables of inter collegiate different positional football players

METHODOLOGY

The purpose of this study is to find out the effects of specific preparatory training on selected physiological variables of inter collegiate football players in various playing positions. To achieve this purpose total subjects twenty four intercollegiate college men-football-players (8 forward 8 mid fielder, 8 defenders) from faculty of general and adapted physical education and yoga, Maruthi college of physical education and Sri Rama Krishna Mission college of arts and science colleges in Coimbatore, were selected as subjects by applying the random sampling techniques. The subjects selected into their position wise namely forward, midfield and defender position each group consist of eight subjects. The subject's age ranged from 17 to 28 years and they formed a true random group design. The selected criterion physiological variables were namely vital capacity and cardio respiratory endurance. The vital capacity was measured by wet spiro meter and cardio respiratory endurance was measured by 12 min/run walk test. The training period consists of twelve weeks Monday to Friday 5 pm to 6 pm. The data were collected pre, mid and post tests were conducted initial and middle and end of training periods. After the training, the collected data were analyzed by applying the one way repeated measures (ANOVA) test. If obtained 'F' was significant new mans kuel test was used to significant difference treatment means pre, mid and post means. Analysis of covariance (ANCOVA) was applied to determine the significant difference among the three groups. If obtained 'F' was significant Scheffe's post hoc test will be used. In all the cases 0.05 was fixed level of confidence.

RESULTS

TABLE-I

ONE WAY REPEATED MEASURES ANOVA ON SELECTED VARIABLES OF PRE, MID AND POST TESTS OF FORWARD POSITION GROUP

Variables	Sources of variance	Sum of Squares	df	Mean Squares	Obtained 'F' ratio
Vital capacity	Between	131875.000	2	65937.500	32.822*
	Error	28125.000	14	2008.929	
Cardio respiratory endurance	Between	65627.083	2	32813.542	10.557*
	Error	43516.250	14	3108.304	

*Significant at 0.05 level. The table value required for significance at 0.05 level with df 2 and 14 is 3.738.

Table I shows that the obtained F-ratio values of forward position group on the selected variables namely vital capacity, cardio respiratory endurance are greater than the table value of 3.738 with df 2 and 14 required for significance at 0.05 level of confidence.

The result of the study indicate that there is a significant difference among the means of two tests of forward position group in vital capacity, cardio respiratory endurance. To find out which of the three paired means had a significant difference, the Newman Keuls post hoc test is applied and the results are presented in table- II & III.

TABLE-II

NEWMAN KEULS TEST FOR THE DIFFERENCES BETWEEN TREATMENT MEANS OF VITAL CAPACITY OF FORWARD POSITION GROUP

Means		Ordered means			Range (r)	Critical Value
		Pre test	Mid test	Post test		
		2400.0	2481.0	2581.2		
Pre test	2400.0	-	81*	181.2*	3	58.63258
Mid test	2481.0	-	-	100.2*	2	48.01533
Post test	2581.2	-	-	-		

* Significant.

TABLE-III

NEWMAN KEULS TEST FOR THE DIFFERENCES BETWEEN TREATMENT MEANS OF CARDIO RESPIRATORY ENDURANCE OF FORWARD POSITION GROUP

Means		Ordered means			Range (r)	Critical Value
		Pre test	Mid test	Post test		
		2717.5	2770.6	2845.0		
Pre test	2717.5	-	53.1	127.5*	3	72.932
Mid test	2770.6	-	-	74.4*	2	59.725
Post test	2845.0	-	-	-		

* Significant.

TABLE-IV

ONE WAY REPEATED MEASURES ANOVA ON SELECTED VARIABLES OF PRE, MID AND POST TESTS OF MIDFIELD POSITION GROUP

Variables	Sources of variance	Sum of Squares	df	Mean Squares	Obtained 'F' ratio
Vital capacity	Between	226458.333	2	113229.167	93.938*
	Error	16875.000	14	1205.357	
Cardio respiratory endurance	Between	201024.250	2	100512.125	8.682*
	Error	162081.083	14	11577.220	

*Significant at 0.05 level. The table value required for significance at 0.05 level with df 2 and 14 is 3.738.

Table XI shows that the obtained F-ratio values of midfield position group on the selected variables namely vital capacity, cardio respiratory endurance are greater than the table value of 3.738 with df 2 and 14 required for significance at 0.05 level of confidence.

The result of the study indicates that there is significant difference among the means of three tests of midfield position group in vital capacity, cardio respiratory endurance. To find out which of the three paired means had a significant difference, the Newman Keuls post hoc test is applied and the results are presented in table V & VI.

TABLE-V

NEWMAN KEULS TEST FOR THE DIFFERENCES BETWEEN TREATMENT MEANS OF VITAL CAPACITYOF MIDFIELD POSITION GROUP

Means		Ordered means			Range (r)	Critical Value
		Pre test	Mid test	Post test		
		2406.2	2512.5	2643.8		
Pre test	2406.2	-	106.3*	237.6*	3	45.416
Mid test	2512.5	-	-	131.3*	2	37.192
Post test	2643.8	-	-	-		

* Significant.

TABLE-VI

NEWMAN KEULS TEST FOR THE DIFFERENCES BETWEEN TREATMENT MEANS OF CARDIO RESPIRATORY ENDURANCEOF MIDFIELD POSITION GROUP

Means		Ordered means			Range (r)	Critical Value
		Pre test	Mid test	Post test		
		2703.8	2786.1	2925.5		
Pre test	2703.8	-	82.3	221.7*	3	140.753
Mid test	2786.1	-	-	139.4*	2	115.265
Post test	2925.5	-	-	-		

* Significant.

TABLE-VII

ONE WAY REPEATED MEASURES ANOVA ON SELECTED VARIABLES OF PRE, MID AND POST TESTS OF DEFENDER POSITION GROUP

Variables	Sources of variance	Sum of Squares	df	Mean Squares	Obtained 'F' ratio
Vital capacity	Between	95643.750	2	47821.875	6.914*
	Error	96839.583	14	6917.113	
Cardio respiratory endurance	Between	178452.000	2	89226.000	8.508*
	Error	146828.000	14	10487.714	

*Significant at 0.05 level. The table value required for significance at 0.05 level with df 2 and 14 is 3.738.

Table VII shows that the obtained F-ratio values of defender position group on the selected variables namely vital capacity, cardio respiratory endurance are greater than the table value of 3.738 with df 2 and 14 required for significance at 0.05 level of confidence.

The result of the study indicates that there is significant difference among the means of three tests of defender position group in vital capacity, cardio respiratory endurance. To find out which of the three paired means had a significant difference, the Newman Keuls post hoc test is applied and the results are presented in table VIII to IX

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TABLE-VIII
NEWMAN KEULS TEST FOR THE DIFFERENCES BETWEEN TREATMENT MEANS OF VITAL CAPACITYOF DEFENSE POSITION GROUP

Variables	Sources of variance	Sum of Squares	df	Mean Squares	Obtained 'F' ratio
Vital capacity	Between	95643.750	2	47821.875	6.914*
	Error	96839.583	14	6917.113	
Cardio respiratory endurance	Between	178452.000	2	89226.000	8.508*
	Error	146828.000	14	10487.714	

* Significant.

TABLE- IX
NEWMAN KEULS TEST FOR THE DIFFERENCES BETWEEN TREATMENT MEANS OF CARDIO RESPIRATORY ENDURANCEOF DEFENSE POSITION GROUP

Means		Ordered means			Range (r)	Critical Value
		Pre test	Mid test	Post test		
		2714.4	2789.4	2922.9		
Pre test	2714.4	-	75	208.5*	3	133.966
Mid test	2789.4	-		133.5*	2	109.707
Post test	2922.9	-	-	-		

* Significant.

TABLE-X
ANALYSIS OF COVARIANCE FORWARD POSITION GROUP MIDFIELD POSITION GROUP AND DEFENSE POSITION GROUP ON VITAL CAPACITY

Test	Forward position group	Midfield position group	Defense position group	Source of variance	Sum of square	df	Mean square	F-ratio
Pre Test mean	2400.0	2406.2	2426.9	Between	3164.5	2	1582.2	0.021
				Within	1565634.3	21	74554.0	
Post test mean	2581.2	2643.8	2575.0	Between	23125.0	2	11562.5	0.146
				Within	1666875.0	21	79375.0	
Adjusted post test mean	2592.0	2648.0	2560.0	Between	32189.8	2	16094.9	1.525
				Within	211135.1	20	10556.7	

* Significant at 0.05 level. Table value for df2 and 21 is 3.466 and for df2 and 20 is 3.492

Table X reveals the computation of 'F' ratios on pre test, post test and adjusted post test means of vital capacity of forward position group, midfield position group and defense position group.

The obtained 'F' ratio for the pre test means of vital capacity of forward position group, midfield position group and defense position groupis0.021. Since the 'F' value is less than the required table value of 3.466 for the degrees of freedom 2 and 21, it is found to be not significant at 0.05 level of confidence.

Further, the post test 'F' ratio 0.146is lesser than the required table value of 3.466 for the degrees of freedom 2 and 21 and hence it is found to be statistically insignificant at 0.05 level of confidence.

The obtained 'F' ratio for the adjusted post test means of vital capacity of forward position group, midfield position group and defense position groupis1.525. Since the 'F' value is lesser than the required table value of 3.492 for the degree of freedom 2 and 20, it is found to be statistically insignificant at 0.05 level of confidence.

FIGURE - 1
ADJUSTED POST TEST MEAN VALUE OF FORWARD POSITION GROUP MIDFIELD POSITION GROUP AND DEFENSE POSITION GROUP ON VITAL CAPACITY

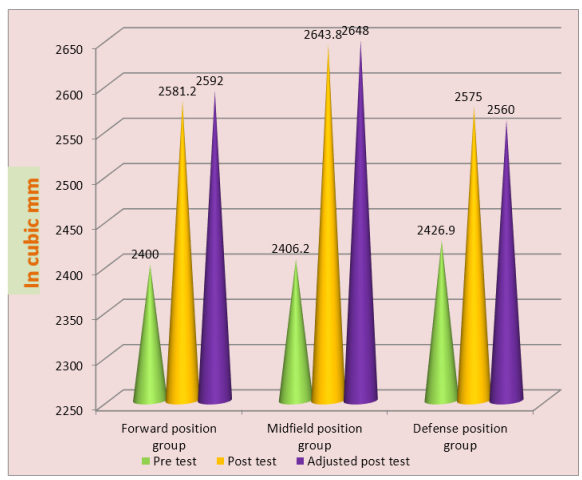


TABLE - XI
ANALYSIS OF COVARIANCE FORWARD POSITION GROUP MIDFIELD POSITION GROUP AND DEFENSE POSITION GROUP ON CARDIO RESPIRATORY ENDURANCE

Test	Forward position group	Midfield position group	Defense position group	Source of variance	Sum of square	df	Mean square	F-ratio
Pre Test mean	2717.5	2703.8	2714.4	Between	831.2	2	415.625	0.02
				Within	492739.3	21	23463.780	
Post test mean	2845.0	2925.5	2922.9	Between	33471.0	2	16735.542	0.3
				Within	994508.8	21	47357.565	
Adjusted post test mean	2839.0	2935.0	2920.0	Between	42832.6	2	21416.315	1.2

* Significant at 0.05 level. Table value for df2 and 21 is 3.466 and for df2 and 20 is 3.492

Table XI reveals the computation of 'F' ratios on pre test, post test and adjusted post test means of cardio respiratory endurance of forward position group, midfield position group and defense position group.

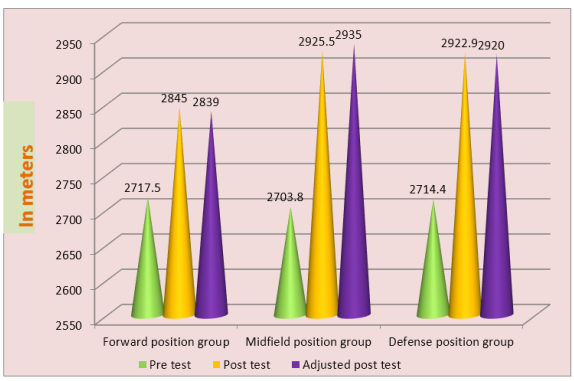
The obtained 'F' ratio for the pre test means of cardio respiratory endurance of forward position group, midfield position group and defense position groupis0.02. Since the 'F' value is less than the required table value of 3.466 for the degrees of freedom 2 and 21, it is found to be not significant at 0.05 level of confidence.

Further, the post test 'F' ratio 0.3is lesser than the required table value of 3.466 for the degrees of freedom 2 and 21 and hence it is

found to be statistically insignificant at 0.05 level of confidence.

The obtained 'F' ratio for the adjusted post test means of cardio respiratory endurance of forward position group, midfield position group and defense position groupis1.2. Since the 'F' value is lesser than the required table value of 3.492 for the degree of freedom 2 and 20, it is found to be statistically insignificant at 0.05 level of confidence.

FIGURE - 2
ADJUSTED POST TEST MEAN VALUE OF FORWARD POSITION GROUP MIDFIELD POSITION GROUP AND DEFENSE POSITION GROUP ON CARDIO RESPIRATORY ENDURANCE



DISCUSSION ON FINDINGS

The results of One way repeated measures analysis of variance indicates that there is a significant improvement in vital capacity, cardio respiratory endurance due to the effect of specific preparatory training in forward position group, midfield position group and defender position group.

However the results of the Newman Keuls indicates that there is a significant difference between pre and post tests; pre and mid tests; mid and post tests in midfield position group. And also it indicates that there is a significant difference between pre and mid tests; pre and post tests; there is no significant difference between mid and post tests in forward position and defender position groups.

Football players must have the vital capacity for effective running approximately two hours. The systematic and scientific creation of the specific preparatory training is advantageous for improving the vital capacity.

Gray, A.J, & Jenkins, D.G., (2010), Vasankari., et al., (2010), Metaxas., et al., (2006) proved that there is an improvement in vital capacity.

Football players must have the cardio respiratory endurance for effective running approximately two hours without fatigue. The systematic and scientific creation of the specific preparatory training is advantageous for improving the cardio respiratory endurance.

Ferrete., et al., (2013), Ingebrigtsen., et al., (2013) proved that there is an improvement in cardio respiratory endurance.

CONCLUSIONS

It was concluded that effect of specific preparatory training significant improvement in forward position, mid field position and defender position groups of selected physiological variables vital capacity and cardio respiratory endurance of inter collegiate football players.

REFERENCE

1.Ferrete., et al., (2013), Ferrete,& Carlos. (2013) Effect of Strength and High- Intensity Training on Jumping, Sprinting and Intermittent Endurance Performance in Prepubertal Soccer Player. Journal of Strength & Conditioning Research | 2.Gray, A.J, & Jenkins, D.G., (2010), Match analysis and the physiological demands of Australian football. Sports Med. Apr 1;40(4):3447- 60. Doi:10.2165/11531400- 3.Valimaki I.A.,&Vasankari T. J. (2010). Low intensity training and maximal oxygen uptake associate with decreased oxidative stress in endurance runners. Gazzetta medicaicaltalianaArchivio per le ScienzeMediche. December; 169(6): 303- 9. | 4.Hardayal Singh,(1997).Science of sports training. Published & printed by Dharam vir singh saini for 100 T.K. Nagag, Kalkaji, New Delhi- 110019(India) ISBN 81- 85466-00-9. | 5.Ingebrigtsen,&Shalfawi.(2013). Performance Effects of 6 Weeks of Aerobic Production Training in Junior Elite Soccer player. Journal of Strength &Conditioning Research. Volume 27- Issue 7- p1861- 1867. | 6.MetaxasT., Sendelides T., Koutlianos N.,&Mandroukas K.(2006). Seasonal variation of aerobic performance in players according to positional role . The of Sports Medicine and Physical Fitness . December; 46(4):520- 5.