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Effect of yoga training and plyometric training on physiological variables of college level students

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Abstract
A comparative study of radiation characteristics of a polarized switchable microstrip planar array of triangular patch antenna The purpose of this study was to compare the effect of yoga training and plyometric training on physiological variables of college level students. Total 60 male students were selected randomly as subjects those who were untrained in sports and games from the different departments of IIT Tirupati. The age group of the subjects was between 18-24 years. The subjects were divided into three groups, each group consisting of 20 subjects. Group 1 (YTG) was undergone yoga training, Group 2 (PTG) was undergone Plyometric training and Group 3 (CG) was control group which was not undergone any specific training. The experimental groups were undergone training for six days in a week for totally 12 weeks. The study was restricted to selected physiological variables namely Vo2 max and Blood pressure. Vo2 max was tested by Coopers 12 minutes' test and Blood pressure was tested by Radial Artery. The data were examined by applying Analysis of Covariance (ANCOVA) and the level of significance was set at 0.05 levels. Based on the analysis of statistical results, two experimental groups namely yoga training and plyometric training made striking and robust advancement in physiological variables i.e. in Vo2 max and Blood pressure whereas the control group did not show any significant result. From the results it was found that plyometric training had shown better result in improving Vo2 max than the yoga training. Results showed that both yoga training and plyometric training did not show any improvement in Blood pressure.

Keywords: Yoga training, Plyometric training, Vo2 max, Blood pressure

Introduction
Paramount importance placed on the necessity of robust fitness by the society has prompted government institutions and its curriculum to emphasis on improved fitness regime. Various innovative methods and approaches have been developed over the years for the improvement of physical fitness in the formative years of a boy or girl's life. National tasks force on community prevention service endorses to design an effective curriculum which would develop strength and sharpen physical skills and stamina of young boys and girls while growing up. Efficacy functioning of physiological aspects such as blood pleasure, Vo2 max, lung capacity, heart rate etc. are played key role in deciding the high performance of a sports person. There are different training programmes such as slow continuous running, weight training, aerobics training, yoga training, plyometric training etc. Now a day's yoga is considered to be an absolute necessity. In the present days when the world has virtually shrunk to be held by the palm of a hand because of the advancement of science. Yoga is the define solution to the physical and mental problems of man. The yogic art which existed in varied forms has now been formulated in a very simple form. The yoga system which consisted very strenuous practices could be followed by only a few. Now it has been so simplified that anybody can practice it very easily. Plyometrics refer to exercises characterized by powerful muscular contractions in response to rapid, dynamic loading or stretching of the involved muscles. Plyometric movements or performed in a wide spectrum of sports in which power is useful. The ability to swiftly apply reactive force is the most important purpose of plyometric training.

Statement of the problem
The purpose of the study was to compare the effect of Yoga training and Plyometric training on physiological variables of college level students.

Materials and Methods
Selection of Subjects
To achieve the purpose of this study, 60 (N=60) untrained students were selected randomly from different departments in Indian Institute of Technology – Tirupati. The subjects' age was ranged between 18 and 24 years as per the college records. The subjects were randomly divided into three groups. Group 1 (Yoga training group) and Group 2 (Plyometric training group) were experimental groups whereas Group 3 was the control group. Each group consisted of 20 subjects.

Selection of Variables
Independent variables
Here two different kinds of training methods which were named as Yoga training and Plyometric training were selected as independent variables.

Dependent variables
Vo2 max and Blood pressure were taken for this study as dependent variables.

Training Programme

During the training programme the two experimental groups i.e. Group 1 was undergone Yoga training programme, Group 2 was undergone plyometric training programme in the morning session. The training was given for six days in a week for twelve weeks in the order to find out the effects on selected variables. Group 3 was a control group and did not go for any training. At the end of the twelfth week, the subjects were tested on the selected physiological variables.

Table 1: Test Administration

S.No	Variable	Test	Measuring Unit
1	Vo2 max	Cooper's 12 Minutes Run or Walk Test	ml/min
2.	Blood pressure	Radial Artery	mm Hg

Statistical Techniques

Necessary measurements were taken from participants of certain variables as part of the post-tests after the twelve weeks was completed. These measurements were closely scrutinized with Analysis of Covariance (ANCOVA) to determine if any modifications were noticed among the participants. The procedure of testing the hypothesis or rejecting the same in accordance with the results obtained in relation to the level of confidence was fixed at 0.05 level for selected physical fitness variables. In addition to that the significance between paired adjusted post-test mean were also tested by computing the confidence interval, utilizing the *Scheffe's post hoc test.*

Results and Discussions

The description, analysis and interpretation of findings with regard to the present study have been presented in two sections. Section one deals with the descriptive statistics and analysis & interpretation of 'F' ratio for three groups. Section two deals with Scheffe's post hoc comparison of paired means differences between experimental and control group.

Table 2: Analysis of Covariance for The Pre Test And Post Test Data Of Experimental Group I, Experimental Group Ii And Control Group on Vo_2 Max

	Exp I (YG)	Exp II (PTG)	CG	SOV	SOS	df	MS	'F' ratio
Pre-test								
Mean	33.49	33.17	33.35	B	1.74	3	0.58	0.20
S.D.	1.72	1.61	1.68	W	219.60	76	2.89	
Post-test								
Mean	35.08	38.65	33.68	B	633.71	3	211.24	87.63*
S.D.	1.54	1.45	1.69	W	183.20	76	2.41	
Adjusted				B	630.44	3	210.15	123.9*
Post-test	40.70	38.76	33.70					
Mean				W	127.21	75	1.70	

*=Significant at 0 .05 level

Table value for df 3 and 76 at 0.05 level = 2.72

Table value for df 3 and 75 at 0.05 level = 2.72

From the above table, clearly observed that the value of pre-test of calculated F (0.20) was less than the table value of F-Statistics (2.72) at 0.05 level of significance. So, there was no statistical variation between control group and experimental groups. The second row having the post-test value of the calculated F was 87.63 which was greater than the table value of F (2.72) at 0.05 level of significance. So, there was a variation between control group and Experimental Groups. In the last row of the table showed that the Adjusted Post Test calculated F-Value was 123.9, which was greater than the critical value of F was 2.72 at 0.05 level of significant. Here also, there existed a variation between two groups i.e. control group and experimental groups.

Table 1(a): Scheffe's Test for the Differences Between The Paired Adjusted, Post Test Means on Vo_2 Max

YPG	PTG	CG	Mean Difference	CI
35.03	38.76		1.94*	0.83
	38.76	33.70	5.67*	
35.03		33.70	1.33*	

Confidence interval value at 0 .05 level = 0.83

In table, calculated that the adjusted mean values of two experimental groups and control groups. From these results, clear evidence has been obtained by comparing between YPG, PTG & CG. Here, there was a statistical variation between any two groups of these combinations. The above table explained that there was a statistical variation difference between PTG & YPG, PTG & CG and YPG & CG at 0.05 level of confidence.

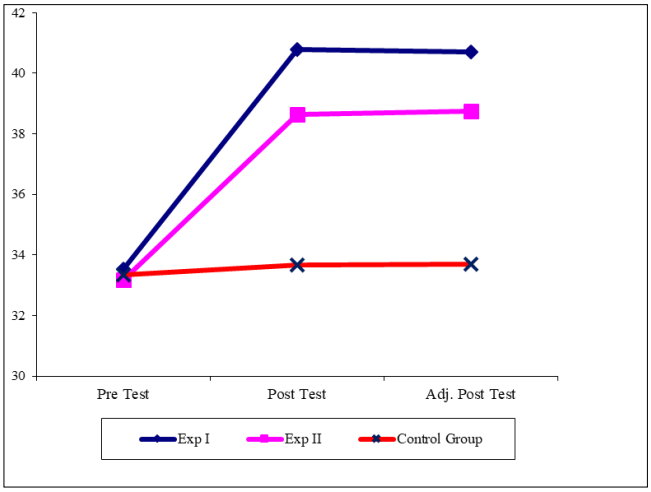

Fig 1: The Pre-Test, Post-Test And Adjusted Post Test Mean Values Of Experimental Groups And Contol Goup On Vo_2 Max

Table 2: Analysis of Covariance for The Pre Test And Post Test Data Of Experimental Group I, Experimental Group Ii Experimental Group Iii And Control Group On Blood Pressure

	Exp I(YG)	Exp II(PTG)	CG	SOV	SOS	df	MS	'F' ratio
Pre-test								
Mean	122.4	122.3	122.6	B	1.34	3	0.45	0.05
S.D.	3.23	2.85	3.27	W	748.35	76	9.85	
Post-test								
Mean	122.05	122.00	122.45	B	2.50	3	0.83	0.13
S.D.	2.63	2.38	2.52	W	501.70	76	6.60	
Adjusted				B	0.87	3	0.29	
Post-test	122.10	122.20	122.30					1.40
Mean				W	15.50	75	0.21	

*=Significant at 0 .05 level
Table value for df 3 and 76 at 0 .05 level = 2.72
Table value for df 3 and 75 at 0 .05 level = 2.72

From the above table, clearly observed that the value of pre-test of calculated F (0.20) was less than the table value of F-Statistics (2.72) at 0.05 level of significance. So, there was no statistical variation between control group and experimental group. In the second row having the post-test value of the calculated F was 0.13 which was less than the table value of F (2.72) at 0.05 level of significance. So, there was no statistical variation between control group and Experimental Groups. In the last row of the table XI, showed that the Adjusted Post Test calculated F-Value was 1.40, which was less than the critical value of F was 2.72 at 0.05 level of significant. Here also, it existed no statistical variation between two groups i.e. control group and experimental groups.

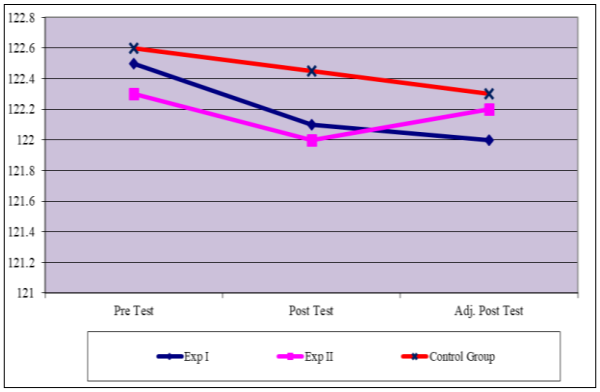

Fig 2 : The Pre-Test, Post-Test And Adjusted Post Test Mean Values Of Experimental Groups And Control Group On Blood Pressure

Conclusions

1. From the study it was concluded that two experimental groups namely yoga training and plyometric training made striking and robust advancement in Vo2 max whereas the control group did not show any significant result.
2. From the results it was found that plyometric training had shown better result in improving Vo2 max when compared to yoga training.
3. From the results it was found that both yoga training and plyometric training did not show any better result in improving both Vo2 max and Blood pressure.

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