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## A study of the influence of physical exercise, circuit training and yogic practice on strength among college girls in Tamilnadu state

**C. Malathy, Dr. C Robert Alexandar Dean**

### Abstract

The purpose of the study was to find out the influence of physical exercise, circuit training and yogic practice on endurance among college girls in Tamilnadu state. one hundred and twenty (n=120) girls in college level have been randomly selected from Tamil Nadu state, India during the academic year 2014 - 2015. The age of subjects ranged from 17 to 20 years. Using matching procedure, the subjects were divided into four equal groups of thirty subjects each. Group-I (n=30) underwent physical exercise training, Group-II (n=30) underwent circuit training, Group-III (n=30) underwent yogic practices training and Group-IV (n=30) acted as control group. The experimental group participated in the physical exercise training, circuit training and yogic practice respectively for 12 weeks, 6 days in a week, one session per day and each session lasted 90 minutes. The data collected from the three groups prior to and post experimentation on the selected dependent variables were statistically analyzed to find out the significant difference if any by applying the analysis of covariance (ANCOVA) And the Scheff's test also applied as post hoc test to determine the paired mean differences. In all the cases the level of confidence was fixed at 0.05 for significance. It was concluded that Iyengar yoga practices training group was significantly better than the sundara yoga training group.

**Keywords:** Strength, Physical Exercise, Circuit Training and Yoga

### 1. Introduction

Physical fitness is a general state of health and well-being or specifically the ability to perform aspects of sports or occupations. Physical fitness is generally achieved through correct nutrition, exercise, hygiene and rest. It is a set of attributes or characteristics that people have or achieve that relates to the ability to perform physical activity.

Before the industrial revolution, fitness was the capacity to carry out the day's activities without undue fatigue. However with automation and changes in lifestyles physical fitness is now considered a measure of the body's ability to function efficiently and effectively in work and leisure activities, to be healthy, to resist hypokinetic diseases, and to meet emergency situations.

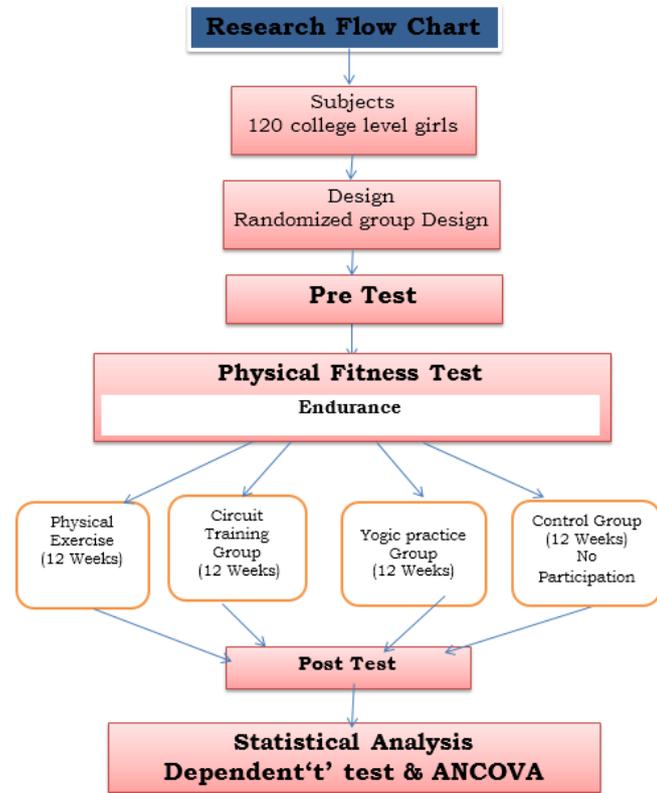
Regular physical activity is one of the most important things one can do for the health. It can help Control the weight, Lower the risk of heart disease, Lower the risk for type 2 diabetes and metabolic syndrome, Lower the risk of some cancers, Strengthen the bones and muscles, Improve the mental health and mood, Improve the ability to do daily activities and prevent falls, if you're an older adult. Circuit training is a fast-paced class in which one do one exercise for 30 seconds to 5 minutes and then move on to another exercise. It's like a game of musical chairs: Everyone begins at a *station* (that is, a place where an exercise is done), and when the instructor yells "Time!" everyone moves to the next free station. Some classes alternate an aerobic activity (like stepping or stationary cycling) with a muscle-strengthening activity (like using weight machines). Others focus exclusively on muscle toning or aerobic exercise.

The circuit training comprises of 6 to 10 strength exercises that are completed one exercise after another. Each exercise is performed for a specified number of repetitions or for a set time before moving on to the next exercise. The exercises within each circuit are separated by a short rest period, and each circuit is separated by a longer rest period. The total number of circuits performed during a training session may vary from two to six depending on your

training level (beginner, intermediate, or advanced), your period of training (preparation or competition) and your training objective.

**2. Statement of the Problem**

The purpose of the study was to find out the influence of physical exercise, circuit training and yogic practice on endurance among college girls in Tamilnadu state.



**3. Analysis of the Data**

The analysis of dependent ‘t’ test on the data obtained for endurance of the pre-test and post-test means of linear speed

**Table II:** Analysis of Covariance for the Data on endurance among Experimental and Control Groups

(Endurance scores are expressed in meters)

Adjusted Post Test Means				Sources of Variance	Sum of Squares	df	Mean Squares	F-Ratio
Physical Exercise Group	Circuit Training Group	Yogic Practice Group	Control Group					
1841.39	1754.24	1687.24	1673.96	Between	526712.29	3	175570.72	328.155*
				Within	61527.7791	115	535.04	

\* Significant at 0.05 level of confidence.

The table value for significance at 0.05 with df 3 and 115 is 2.687.

Table II shows that the adjusted post-test means of physical exercise, circuit training, yogic practice and control groups on endurance are 1841.39, 1754.24, 1687.24 and 1673.96 respectively.

The obtained F-ratio value is 328.155, which is higher than the table value 2.687 with df 3 and 115 required for

**Table III:** Scheffe’s test for the differences between the adjusted posttest paired means of Endurance

Physical Exercise Group	Circuit Training Group	Yogic Practice Group	Control Group	Mean Difference	Confidential Interval
1841.39	1754.24			87.148*	16.966
1841.39		1687.24		154.150*	
1841.39			1673.97	167.426*	
	1754.24	1687.24		67.002*	
	1754.24		1673.97	80.278*	
		1687.24	1673.97	13.276	

\*Significant at .05 level.

package training and control groups has been analysed and presented in Table I.

**Table I:** Summary of Mean Standard Deviation and Dependent ‘t’ Test for the Pre Post and Adjusted Post Tests on endurance of Experimental and control Groups

(Endurance scores are expressed in meters)

		Physical Exercise Group	Circuit Training Group	Yogic Practice Group	Control Group
Pre test	Mean	1669.00	1671.67	1675.83	1667.67
	SD	13.22	15.11	12.46	14.07
Post test	Mean	1840.00	1754.67	1690.50	1671.67
	SD	34.94	25.02	13.28	21.19
‘t’ test		26.86*	18.44*	9.81*	1.25

\*Significant at .05 level. The table value required for .05 level of significance with df 29 is 1.699.

Table I shows that the pre-test mean values of physical exercise, circuit training, yogic practice and control groups on endurance are 1669.00, 1671.67, 1675.83 and 1667.67 respectively and the post-test mean values on endurance are 1840.00, 1754.67, 1690.50 and 1671.67 respectively. The obtained dependent t-ratio values between the pre and posttest means of physical exercise, circuit training, yogic practice and control groups on endurance are 26.86, 18.44, 9.81 and 1.25 respectively. The table value required for significant difference with df 29 at .05 level is 1.699. Since, the obtained ‘t’ ratio values of experimental groups are greater than the table value, it is understood that physical exercise, circuit training, yogic practice groups had significantly improved the performance of endurance. However, the control group had not improved significantly on the performance of endurance. Since the obtained ‘t’ value is less than the table value, as they were not subjected to any specific training.

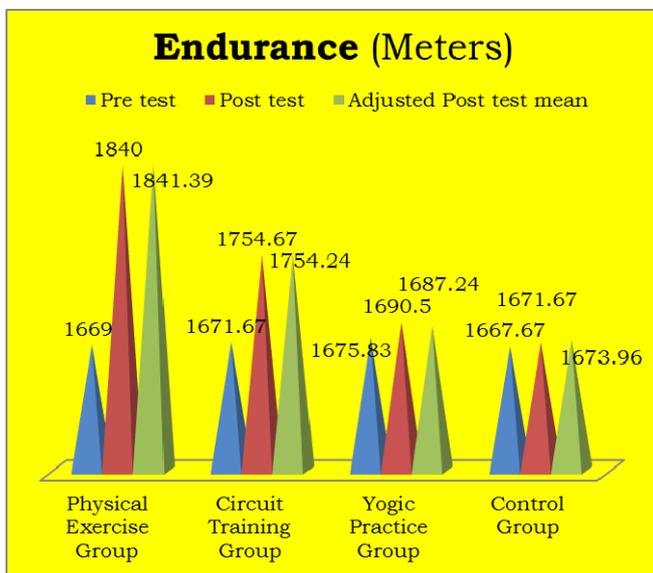
The analysis of covariance on endurance of physical exercise, circuit training, yogic practice and control groups has been analysed and presented in Table II

significance at .05 level. Since the value of F-ratio is higher than the table value, it indicates that there exist significant differences among the adjusted post-test means of physical exercise, circuit training, yogic practice and control groups on endurance. To find out which of the paired means had a significant difference, the Scheffe’s post-hoc test was applied and the results are presented in table III.

The table III shows that the adjusted posttest mean difference on endurance between physical exercise and circuit training, physical exercise and yogic practice, physical exercise and control group, circuit training and yogic practice, and circuit training and control group are 87.15, 154.1550, 167.43, 67.00 and 80.28 respectively which are higher than the confidence interval value of 16.966 at .05 level of confidence. The adjusted posttest mean difference on endurance between yogic practice and control group is 13.276 which are less than the confidence interval value 16.966. This shows that there is no significant difference on endurance between yogic practice and control group at .05 level of confidence.

The result of the study indicates that, all the experimental groups were significantly differed when compared to control group on endurance. However, it is further revealed that the experimental group namely physical exercise training group had improved the performance of endurance better than the other three groups.

The pre, posttest and adjusted posttest mean values of physical exercise, circuit training, yogic practice and control groups on endurance were graphically represented in the figure I.



**Fig I:** Pre, post and adjusted posttest mean values of physical exercise, circuit training, yogic practice and control groups on endurance

#### 4. Discussion on Findings

The result of this study indicates that, the control group does not show any significant difference on endurance. Endurance improved due to training of physical exercise, circuit training and yogic practice.

The effect of the physical exercise was greater than circuit training and yogic practice on endurance among the college girls in Tamil Nadu state. The findings of this study were also similar with the results of circuit training which suggested the existence of effect of yogic practice on endurance.

Tran *et al.*, (2001) [6] studied ten healthy, untrained volunteers (nine females and one male), ranging in age from 18-27 years, to determine the effects of hath yoga practice on the health-related aspects of physical fitness, including muscular strength and endurance, flexibility, cardio respiratory fitness, body composition, and pulmonary function. These findings indicate that regular hatha yoga practice can elicit improvements in the health-related aspects

of physical fitness.

Jabakumar (2011) [2] conducted a study on Impact of Circuit Training on Selected Motor Fitness and Kinaesthetic Sense among Hockey the purpose of the study was to analyse the effect of circuit training on college men Hockey players on selected biomotor variables and kinaesthetic sense. The results of the study indicate that there was improvement in speed, agility, endurance and kinaesthetic sense after the stipulated period owing to 6 weeks circuit training. In case of explosive Power, there was no significant between the experimental and control group. Even though the circuit training was not given to control group, the previous experience of the players may influenced the performance of explosive power.

Karthikeyan *et al.* (2012) [3] conducted study on the effects of circuit and moving circuit training on selected strength and power parameters such as leg strength and explosive power in terms of vertical distance. There was significance different among circuit training group, moving circuit training group and control group on leg strength there was significance different among circuit training group, moving circuit training group and control group on explosive power in terms of vertical distance.

Saroja, (2012) [5] investigated the effects of complex training and the combined Effects of complex training and yogic practices on selected physical and physiological variables among college boys. It was concluded that combined effects of complex training and yogic practices significantly improved the selected physical and physiological variables greater in magnitude than the complex training alone among the college male students.

Bharatha Priya and Gopinath, (2011) [1] studied the effect of yogic practice on flexibility among school boys. The results of pre-test and posttest were compared with using Analysis of Co-variance. Finding of flexibility shows significant improvement due to the twelve weeks yogic practice when compared to the control group.

Komathi and Kalimuthu, (2011) [4] framed the effect of yogic practices on abdominal strength among school boys. The results of pre-test and post-test were compared with using Analysis of Covariance. Finding of abdominal strength shows significant improvement due to the twelve weeks yogic practice when compared to the control group.

#### 5. Discussion on Hypothesis

In the first hypothesis, it was mentioned that there would be a significant difference exist between the experimental groups and also with control group on endurance, agility and flexibility after the training period. The present study produced similar results. Hence the first research hypothesis of the investigator was accepted for selected dependent variables.

In the second hypothesis, it was mentioned that there would be a significant differences among the experimental groups on the selected physical fitness component endurance among the college girls. The present study produced similar results. Hence the second research hypothesis of the investigator was accepted for selected dependent variables.

#### 6. Conclusions

The following conclusion have been made in the light of the findings of the present study,

1. There was a significant improvement on endurance due to the influence of physical exercise training, circuit training and yogic practice among college girls in

Tamilnadu state.

2. The control group college girls had not shown significant changes in any of the selected variables.

The results of this present investigation clearly indicate that physical exercise training, circuit training and yogic practice could enhance the performance level of college girls in all the selected physical fitness variables. Hence, it is recommended that coaches/physical educators should give due importance to physical exercise training, circuit training and yogic practice training packages in their schedule. It is recommended that the coaches and Physical Education Teachers can prepare Training models using Physical Exercise, Circuit training and Yogic practices since these training could enhance the performance. A similar study may be conducted in greater detail to assess changes on biochemical variables.

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