



Effect of Circuit Training, Resistance Training and Combined Training on Selected Physical Variable Among School Boys

KEYWORDS

Circuit training, Resistance training and Combined training.

P.Sooran

Ph.D (Part-Time Research Scholar)

Dr.M.Sundar

Principal, Alagappa University College of Physical Education, Alagappa University, Karaikudi.

ABSTRACT

The purpose of the study was to find out the Effect of circuit training, resistance training and combined training on selected physical variable among school boys. To achieve the purpose of this study, 60 boys were selected randomly from R.S.Govt.Hr.Sec.School, Paramakudi, Ramanathapuram District, Tamil Nadu, during the year 2015-16, their age ranged from 15-17 years. They were divided into four equal groups and each group consists of 15 subjects. Group A underwent circuit training; Group B underwent resistance training and Group C underwent combined training (circuit and resistance training) for six days per week for 12 weeks on alternative days and Group D acted as a control who did not involve any special training apart from the regular curricular activities. Speed and explosive power was taken as criterion variables in this study. The collected data were analyzed statistically by using the analysis of variance (ANOVA) to determine the differences, Analysis of covariance (ANCOVA) was used to determine the differences, and the Scheffe's test was applied as post hoc test to find out paired mean differences. In all cases 0.05 level of confidence was selected to test the hypotheses.

INTRODUCTION

In the words of C Samadi, "Training is a pedagogical process which makes possible the achievement of high standard performance without any physical or mental damages, through planned systematic development of certain specific skills, physical capabilities and the adaptation of the organism". Training is defined as, 'a systematic process of repetitive, progressive exercise (or) work, involving the learning process and acclimatization'.

This circuit training is a combination of high intensity aerobics and resistance training designed to be easy to follow, give you a great workout, and target fat loss, muscle building and heart-lung fitness. An exercise "circuit" is one completion of all prescribed exercises in the program; the idea being that when one circuit is complete, you start at the first exercise again for another circuit. Traditionally, the time between exercises in circuit training is short, often with rapid movement to the next exercise. An exercise circuit is simply a way to arrange your workout so that different exercises for each body part or motor pattern follow each other with minimal rest. This training method allows you to train specific muscles and movements in a way of matching your goals, while requiring your cardio-vascular system to continuously provide your body with oxygen. You can train each exercise for a certain number of repetitions, or for a certain period of time. Circuits can also be set up to facilitate training groups of people, each trainee moving through the stations.

According to the American College of Sports Medicine(2009)(ACSM),Improved cardiovascular health, lower blood pressure and reduced risk of suffering from coronary heart disease are proved; whereas resistance training improves the tone and strength of the muscles and also increase the bone mass, which is important for reducing risk of developing osteoporosis. To get the most out of aerobic exercise, according to the ACSM (2009), perform at least three 20-minute workouts per week where the heart rate is elevated to between 60 and 90 percent of maximum. This prescription improves aerobic fitness and health. Resistance training, sometimes

called strength or weight training, doesn't necessarily mean bodybuilding or weightlifting. Both body building and weightlifting are sports, whereas resistance training is done not for competition but for the benefits associated with working out with weights. To get the most from resistance training, you should lift weights two to three times a week ensuring all of your muscles receive equal attention.

METHODS

To achieve the purpose of the study, the 60 boys were selected from R.S.Govt.Higher secondary school, paramakudi, Tamil Nadu, their age ranged between 15 to 17 years. The selected subjects were randomly divided into four equal groups consisting of fifteen each. No attempt was made to equate the groups. Experimental group I circuit Training (CTG), Experimental Group II Resistance Training (RTG), Experimental Group III Combinations of circuit training Resistance Training (CTGARTG) and Group IV Control group for a period of 12 weeks.

Table.1.

Circuit and package Training schedule for 12 weeks

Exercise Name	Intensity	Repetitions	Set	Rest period
Experimental group I –Circuit Training				
Circuit training- Press up, Prone trunk extensions, Sit-ups , Abdominal crunch, Skipping, Squat jump, High knee sprints and Burpees	60%	10 times	5	30 seconds
	70%	8 times	6	
	80%	6 times	7	
Experimental group II –Resistance Training				
Resistance training- Two Arm curl, Triceps extension, Military Press, Peck-deck, Abdominal Crunches, Hip abduction, Leg curl and Half Squat	60%	10 times	3	30 seconds
	70%	8 times	4	
	80%	6 times	5	

Experimental group III –Combined Training(Circuit & Resistance Training)				
Circuit training- Press up, Prone trunk extensions, Sit-ups , Abdominal crunch, Skipping, Squat jump, High knee sprints and Burpees	60%	10 times	5	30 seconds
	70%	8 times	6	
	80%	6 times	7	
Resistance training- Two Arm curl, Triceps extension, Military Press, Peck-deck, Abdominal Crunches, Hip abduction, Leg curl and Half Squat	40%	10 times	3	30 seconds
	50%	8 times	4	
	60%	6 times	5	

After twelve weeks of training post test was conducted and the readings were carefully recorded as post test

Table No.3.

Analysis of Covariance for the pre and post-test data on speed of Circuit training group, Resistance training group and Combined trainings group and control group

(Speed means count by Seconds)

Test	Circuit training	Resistance training	Combined training	Control group	Source of variance	Sum of square	Df	Mean square	'F' ratio
Pre test Mean	7.72	7.729	7.73	7.82	Between	.103	3	.034	.86
					Within	7.74	56	.138	
Post test Mean	7.35	7.42	7.30	7.82	Between	2.582	3	.861	7.66*
					Within	6.292	56	.112	
Adjusted post test mean	7.77	7.43	7.32	7.77	Between	1.806	3	.602	26.64*
					Within	1.243	55	.023	

***Significance at 0.05 levels**

B.M.-Between Means W.G. - Within Groups B.S. Between sets W.S.-Within Sets

(Speed means count by Seconds)

Table value required for significant at 0.05 level with df 3 and 56 and 3 and 55 are 2.76 and 2.77 respectively.

The statistical analysis from the table shows that the pre-test means of Circuit trainings group, resistance training, combined training and control group are 7.720,7.729,7.727 and 7.821 respectively. The obtained F ratio .86 for pre-test is lesser than the table value of 2.76 for df 3 and 56 required for significance at 0.05 level. The post-test means of Circuit trainings group, resistance training, combined training and control group are found 7.350,7.436,7.325 and 7.82 respectively. The obtained F ratio 7.66* for post-test is greater than the table value of 2.76 for df 3 and 56 required for significance at 0.05 level. The adjusted post-test means of Circuit trainings group, resistance training, combined training and control group are 7.774, 7.436, 7.325 and 7.771 respectively. The F ratio obtained for adjusted post-test 26.64* is also greater than the table value of 2.77 for df 3 and 55 required for significance at 0.05 level.

score.

The subjects of all the four groups were tested on speed prior to and after the training period.

To ascertain speed of the subjects was used and accordingly 50 Mts dash Run Test was administered mean value count by Seconds.

STATISTICAL TECHNIQUES

The data collected from the three groups were statistically analyzed for significance, the analysis of covariance (ANCOVA) was used and the F ratio was found out. The Scheffe's test is applied as post-hoc test to determine the paired mean differences. The level of significance will be fixed at .05 level of confidence for all the cases. All the statistical operations were done through SPSS software (20 version).

RESULTS AND DISCUSSION

Table.3.

Scheffe's test for the differences between the adjusted post-test paired means on speed (Speed means count by Seconds)

Circuit training	Resistance training	Combined training	Control group	Mean difference	C.I Value
7.774	7.436	-	-	0.33*	0.09
7.774	-	7.325	-	0.45*	
7.774	-	-	7.77	0.004	
-	7.436	7.325	-	0.11*	
-	7.436	-	7.77	0.33*	
-	-	7.325	7.77	0.45*	

***Significance at 0.05 level**

In the above table, the results of Scheffe's Post hoc test are presented. From the table it can be seen that the mean difference between Circuit training group and Resistance training group was 0.33* (P>0.05) and the calculated C.I value is 0.09 (P<0.05). The mean difference between Circuit training group and combined training group was 0.45* (P>0.05) and the calculated C.I value is 0.09 (P<0.05). The mean difference between Circuit training group and the control group is 0.004 (P<0.05) and the calculated C.I value was 0.09 (P>0.05). The mean difference between resistance training group and combined training group was 0.11* (P>0.05) and the calculated C.I value is 0.09 (P<0.05). The mean difference between the

resistance trainings group and the control group was 0.33* ($P > 0.05$) and the calculated C.I value is 0.09 ($P < 0.05$). The mean difference between the combined trainings group and the control group was 0.45* ($P > 0.05$) and the calculated C.I value is 0.09 ($P < 0.05$). From that it can be clearly noticed that combined training group responded to the training with more positive influences of speed when compared with the circuit training group, resistance training and control group. The circuit training group responded better when compared with the resistance training and control group. The resistance training group responded better when compared with the control group.

CONCLUSION

The results of the study indicate that the experimental groups namely circuit training group, Resistance training, and Combined training group has significantly differed from the selected dependent variable namely speed when compared to the control group. It is also found that the improvement caused by combined trainings was greater when compared to the effects caused by the Circuit training group, resistance training and control group. It is also found that the improvement caused by circuit training was greater when compared to the effects caused by the resistance training and control group. It is also found that the improvement caused by resistance training was greater when compared to the effects caused by the control group.

REFERENCES

1. Bocalini DS, Lima LS, de Andrade S, et al. (2012) "Effects of circuit-based exercise programs on the body composition of elderly obese women". *Clin Interv Aging*.7:551-6.
2. Daniel D. Arnheim, (2009) Modern Principles of Athletic Training 6th ed. (**American College of Sports Medicine** (ACSM) Pg No: 178-184.
3. Miller MB, Pearcey GE, et al. (2014) "The effect of a short-term high-intensity circuit training program on work capacity, body composition, and blood profiles in sedentary obese men: a pilot study". *Biomed Res Int*.191797.
4. Rosety-Rodriguez M, Camacho A, (2013) "Resistance circuit training reduced inflammatory cytokines in a cohort of male adults with Down syndrome". *Med Sci Monit*. 19:949-53.
5. Samadi C. (2015) "Whole-body aerobic resistance training circuit improves aerobic fitness and muscle strength in sedentary young females". *J Strength Cond Res*.29(6):1592-600.
6. Strassnig MT, Signorile JF, (2015) "High velocity circuit resistance training improves cognition, psychiatric symptoms and neuromuscular performance in overweight outpatients with severe mental illness". *Psychiatry Res, Elsevier Ireland Ltd* .pii: S0165-1781(15)00452-7.