



IMPACT OF OWN BODY WEIGHT CIRCUIT TRAINING PROGRAM ON PHYSICAL AND PHYSIOLOGICAL VARIABLES OF SCHOOL BOYS

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ABSTRACT

Many researchers proved strength training is one of the appropriate method planned to develop physical, physiological and performance of the sports persons. Hence, it is good to find out the impact of own body weight circuit training program on the selected physical and physiological variables of school boys. To achieve the purpose of the study, thirty (30) physically active boys were randomly selected from G. S. Hindu Higher Secondary School, Srivilliputtur, Virudhunagar Dist, TN, during the academic year 2014-15. Their age ranged from 15 to 17 years. The selected subjects were divided into two (15) equal groups, namely Training (TG) and control (CG) groups. The training group underwent weekly three days for 12 weeks of own body weight circuit training and no treatment was given to the Control group. The collected data were analysed and computed by *t* test. The result of the study shows that own body weight circuit training produced a significant changes in physical (Muscular strength-*t* = 5.24 and Speed-*t* = 8.76, $P < 0.05$) and physiological (Resting heart rate-*t* = 6.55 and Breath holding time-*t* = 10.86, $P < 0.05$) variables of the training group.

Keywords: Circuit training, Muscular strength, Resting heart rate, Breath holding time.

INTRODUCTION

Circuit training is one of the popular training methods designed to develop strength, power, muscular endurance, speed, agility and neuromuscular coordination, flexibility and cardiovascular endurance. Circuit training combines a number of different components of training, thus total fitness is emphasized. It was developed by R. E. Morgan and G. T. Adamson in 1953 at the University of Leeds in England (Kraviz, 1996).

Circuit training provides an interesting training atmosphere for the athlete and there are established times and level to motivate the athlete to continue improving. It can be adapted within

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the time constrains of the individual. This training is an excellent way to concurrently improve mobility and build strength. The circuit training format utilizes a group of 6 to 10 strength exercises that are completed one after the other in an order.

Each exercise is performed for a specified number of repetitions or for a given time period before moving on to the next exercise. The exercises within each circuit are separated by brief, timed rest intervals, and each circuit is divided by a longer rest period. The total number of circuit performed during a training session may differ from two to six depending on training level of subjects (beginner, intermediate or advanced), period of training and training objectives.

METHODOLOGY

Selection of Subjects

To achieve the purpose of the study, thirty (30) physically active boys were randomly selected from G. S. Hindu Higher Secondary School, Srivilliputtur, Virudhunagar Dist, TN, during the academic year 2014-15. Their age ranged from 15 to 17 years. The selected subjects were divided into two (15) equal groups, namely Training (TG) and control (CG) groups. The training group underwent weekly three days for 12 weeks of own body weight circuit training and no treatment was given for the Control group.

Selection of Variables

To find out the impact of training the researcher selected the following variables for the present study.

Sl. No	Variables	Test
Physical variables		
1	Muscular strength (Paul and Guy, 1976)	Pull up
2	Speed (Paul and Guy, 1976)	50 m dash
Physiological variables		
3	Resting heart rate (O'Rourke and Fuster, 2001)	Radial Pulse
4	Breath holding Time (Kennedy, 1956)	Breath Holding

Statistical analysis

The collected data on the selected dependent variables were statistically analyzed by dependent "t" test to find out the significant improvement between pre and post tests of training and control groups at the 0.05 level of confidence.

Results

TABLE-I
COMPUTATION OF 't'-RATIO BETWEEN PRE AND POST TEST MEANS OF TRAINING AND CONTROL GROUPS ON MUSCULAR STRENGTH (PULL UPS - SCORES IN NUMBER)

Test		Mean	SD	MD	t-ratio
TG	Pre test	6.46	0.64	0.86	5.24*
	Post test	7.33	0.62		
CG	Pre test	6.53	0.64	0.13	1.46
	Post test	6.66	0.72		

*significant at 5% level ($P < 0.05$), table value (2.145)

The above table displays the mean values of pre and post test of training group. They are 6.46 and 7.33. Since, the obtained 't' ratio of 5.24 is greater than the required table value of 2.145, it is found to be statistically significant at 0.05 level of confidence. The results clearly indicate that the muscular strength of the training group improved due to own body weight circuit training. There is no significant improvement on control group at 0.05 level of confidence.

TABLE-II
COMPUTATION OF 't'-RATIO BETWEEN PRE AND POST TEST MEANS OF TRAINING AND CONTROL GROUPS ON SPEED (50 m DASH - TIME IN SECONDS)

Test		Mean	SD	MD	t-ratio
TG	Pre test	8.12	0.04	0.12	8.76*
	Post test	8.00	0.07		
CG	Pre test	8.10	0.05	0.002	1.87
	Post test	8.09	0.04		

*significant at 5% level ($P < 0.05$), table value (2.145)

The above table displays the mean values of pre and post test of training group are 8.12 and 8.00 respectively. Since, the obtained 't' ratio of 8.76 is greater than the required table value of 2.145, it is found to be statistically significant at 0.05 level of confidence. The results clearly indicate that the speed of the training group improved due to own body weight circuit training. There is no significant improvement on control group at 0.05 level of confidence.

TABLE-III
COMPUTATION OF 't'-RATIO BETWEEN PRE AND POST TEST MEANS OF TRAINING AND CONTROL GROUPS ON RESTING HEART RATE (RADIAL PULSE – NUMBER OF BEATS PER MINUTE)

Test		Mean	SD	MD	t-ratio
TG	Pre test	63.66	1.79	1.40	6.55*
	Post test	62.26	1.27		
CG	Pre test	63.46	1.68	0.20	1.87
	Post test	63.26	1.66		

*significant at 5% level ($P < 0.05$), table value (2.145)

The above table displays the mean values of pre and post test of training group are 63.66 and 62.26 respectively. Since, the obtained 't' ratio of 6.55 is greater than the required table value of 2.145, it is found to be statistically significant at 0.05 level of confidence. The results clearly indicate that the resting heart rate of the training group improved due to own body weight circuit training. There is no significant improvement on control group at 0.05 level of confidence.

TABLE-IV
COMPUTATION OF 't'-RATIO BETWEEN PRE AND POST TEST MEANS OF TRAINING AND CONTROL GROUPS ON BREATH HOLDING TIME (BREATH HOLDING - SCORES IN SECONDS)

Test		Mean	SD	MD	t-ratio
TG	Pre test	42.51	0.61	1.05	10.86*
	Post test	43.56	0.59		
CG	Pre test	42.50	0.608	0.009	1.70
	Post test	42.49	0.609		

*significant at 5% level ($P < 0.05$), table value (2.145)

The above table displays the mean values of pre and post test of training group are 42.51 and 43.56 respectively. Since, the obtained 't' ratio of 10.86 is greater than the required table value of 2.145, it is found to be statistically significant at 0.05 level of confidence. The results clearly indicate that the breath holding time of the training group improved due to own body weight circuit training. There is no significant improvement on control group at 0.05 level of confidence.

DISCUSSION

The present study examined the impact of own body weight circuit training on physical and physiological variables of school boys. The result of this study revealed that the own body weight

circuit training improved the physical (Muscular strength and Speed) and Physiological (Resting heart rate and Breath holding time) variables, which are in conformity with the findings of Martin & George (2015), Vinayagamoorthi & Sakthivel (2014), Cittibabu & Akilan (2013) and Kaikkonen et al., (2000).

CONCLUSION

Based on the results, it is concluded that 12 weeks of own body weight circuit training program produced a significant improvement in the physical (Muscular strength and Speed) and Physiological (Resting heart rate and Breath holding time) variables of school boys.

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