



Original Research Article

## Effect of Six Weeks Circuit Training on Resting Heart Rate among Active Adult Women

Pintu Sil

Assistant Professor, State Institute of Physical Education for Women, Hastings House, Kolkata, India

Received: 02/06/2015

Revised: 19/06/2015

Accepted: 20/06/2015

### ABSTRACT

Heart rate is the number of times the heart beats per minute. It is a good indicator of cardiovascular fitness and health of a person. Lower heart rate in resting condition and exercise condition is also indication of good health and physiological fitness. Sports training might be helpful to have lower heart rate at resting and after exercise conditions. Circuit training is an effective method of developing strength and endurance. Purpose of the study was to find out the effect of six weeks circuit training on resting heart rate (RHR) in active adult women. A total of 36 female college students in between 21 to 30 years of age were randomly chosen as subjects for the present study. Among them 36 students were divided in two groups by means of randomization for the purpose of experimental design. G1 group (N=18) was considered as experimental group and G2 group (N=18) was considered as control group. G1 group was treated with six week circuit training and after six week both group were tested and result was compared with appropriate statistics. True experimental group design was used in this study. The circuit training schedule was set up with the consultation of experts in the field of exercise science and athletics. There were six stations of exercise. First two weeks the exercise was performed with 40-50% load and every two week interval the load amount increased. Result revealed that t value of RHR for control group ( $t=0.399$ ) was not significant ( $p<0.05$ ) and t-value of RHR for experimental group between pre and post test mean ( $t=0.73$ ) was also not significant statistically ( $p<0.05$ ). Findings revealed that well planned six week circuit training programme was not much effective to reduce RHR in active adult women.

**Key words:** Circuit training, Exercise effect, Resting heart rate, Bradycardia, Active adult women

### INTRODUCTION

Heart rate is the number of times the heart beats per minute. Heart rate can be judged through counting heart rate both at rest and during exercise conditions. Heart rate is markedly decreased as a result of physical training particularly endurance training. After 10-12 weeks of endurance training resting heart rate can come down

subsequently below the normal 80 to 70 beats/min. Highly conditioned endurance athletes usually have resting heart rate lower than 60 beats/min and some have even lower than 40 beats/min. <sup>[1]</sup> During exercise our heart rate should increase to meet the need of our active muscles. Normally after finishing the exercise our heart rate does not come down immediately rather it takes some time to return to its resting rate.

Exercise has so many benefits to human body. Frequent and regular physical exercise boosts the immune system, and helps prevent heart disease, cardiovascular disease, type-2 diabetes and obesity. [2-4] It also improves mental health, helps prevent depression helps to promote or maintain positive self-esteem Exercise can help prevent excess weight gain or help maintain weight loss. Engagement in physical exercise helps to burn calories. The more intense the activity, the more calories will burn.

Circuit training is an effective method of developing strength and endurance. A circuit of 6-10 exercises is arranged in a way that different muscle groups are exercised at different station. The performer moves from one station to another and undertakes load and recovery respectively and continuously. Generally 3-5 sets are performed and actual number depends upon the training state of the sport person. Between sets full recovery should be provided. The intensity of exercise at each station is about 40-50% of maximum. [5] Present study was conducted to find out the effect of six weeks circuit training on resting heart rate (RHR) in young adult women.

## **MATERIALS AND METHODS**

### **The subject**

A total of 36 female college students were randomly chosen as subjects for the present study. The age of the students was in between 21 to 30 year. All the subjects had some sports background and participate in regular physical activities five day a week.

### **Design of the study**

The 36 students were divided in two groups by means of randomization for the purpose of experimental design. G1 group (N=18) was considered as experimental group and G2 group (N=18) was considered as control group. G1 group was treated with six week circuit training and after six week

both group were compared with appropriate statistics. True experimental group design was used in this study. [6]

### **Exercise protocol**

The circuit training schedule was set up with the consultation of experts in the field of exercise science and trainer. There were six stations of exercise. First two weeks the exercise was performed with 40-50% load and every two week interval the load amount increased. Details of schedule have been presented in Table-1.

### **Criterion measure**

Resting heart rate (RHR) was the criterion measure in this study.

### **Instrument and tools used:**

Stethoscope was used to assess resting heart rate (RHR) by using anthropometric equation in this study.

### **Design of the study and statistical procedure used:**

Mean and Standard Deviation (SD) were computed and used as descriptive statistics in this study. Training effect between control group and experimental group was analyzed by t- test method. Only 0.05 level of confidence was considered for this study. All statistical calculations have been done by using standard statistical software.

## **RESULTS AND FINDINGS**

The Mean value and SD of pre test and post test data regarding RHR of control group and experimental group have presented in Table-2. It was cleared from table-2 that mean values of RHR of pre test and post test result for both groups was different. In order to find out whether this difference was truly for treatment effect or might be due to error in sampling technique or other causes, the t-test was computed for both groups and result also have presented in same Table. It is clear from Table-2 that t-value for PBF of control group was 0.399, which was not significant at 0.05 level of

confidence and t-value for RHR of experimental group was 0.73 which was also not significant at 0.05 level of confidence. The findings about effect of circuit training on RHR have presented graphically in

Figure-1 which also indicated clearly that six week circuit training programme was not effective to change in RHR among adult women.

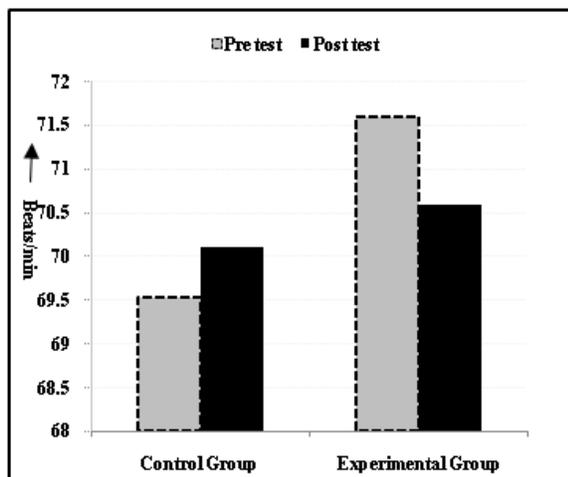
**Table-1: Detail of circuit training schedule**

	Stations	Skipping	Sit ups	Forward bending	Modified push up	Step up & down	Squat thrust
1 <sup>st</sup> - 2 <sup>nd</sup> Week	Load	50-60%	40-50%	40-50%	40-50%	40-50%	40-50%
	Duration	30 sec	30 sec	5 times	10 times	40 times	30 sec
	set	3-5	3-5	3-5	3-5	3-5	3-5
	Recovery period in between 2 set	30 sec	30 sec	30 sec	30 sec	30 sec	30 sec
3 <sup>rd</sup> -4 <sup>th</sup> Week	Load	60-70%	60-70%	60-70%	60-70%	60-70%	60-70%
	Duration	45 sec	45 sec	10 times	14 times	50 times	45 sec
	set	3-5	3-5	3-5	3-5	3-5	3-5
	Recovery period in between 2 set	40 sec	40 sec	40 sec	40 sec	40 sec	40 sec
5 <sup>th</sup> -6 <sup>th</sup> Week	Load	70-80%	70-80%	70-80%	70-80%	70-80%	70-80%
	Duration	60 sec	60 sec	15 times	18 times	60 times	60 sec
	set	3-5	3-5	3-5	3-5	3-5	3-5
	Recovery period in between 2 set	50 sec	50 sec	50 sec	50 sec	50 sec	50 sec

**Table-2: Descriptive statistics of RHR**

Statistical Parameters	Pre Test		Post Test		t-value
	Mean	SD	Mean	SD	
Control Group	69.53	4.73	70.11	3.95	0.399 <sup>^</sup>
Experimental Group	70.59	3.87	71.61	3.18	0.73 <sup>^</sup>

<sup>^</sup> Not significant (to be significant at 0.05 level CR has to be 2.04).



**Figure-1: Resting Heart Rate (RHR) of the subjects**

The findings shows that experimental group had higher mean value than the control group in pre training condition and also in post training condition. It also indicated that after intervention the resting heart rate of experimental group slightly increased. Text book and study reported that

exercise training or sports training caused Bradycardia of the Heart in which condition RHR decreased. [7,8] This symptom is a important characteristic of Athletic Heart. Study reported that few weeks training might improved fitness of the subjects [9] but did not have any significant effect on heart rate variability. [10] Slight higher RHR at post training condition might be due to the psychological stress of the subjects, felt during the test condition. It might also be due to the excess physical load of circuit training imposed on them in addition to their normal load of regular physical activity schedule.

## CONCLUSIONS

On the basis of result it was concluded that six week circuit training has no significant effect on Resting Heart Rate (RHR) among adult women who are already engaged in sports and physical education activities regularly.

## REFERENCES

1. Singh, R. Baines, A. Singh Gill, J. Barr, R.S. Rather, N. (2012), Essential of Physical Education, Kalyani Publishers. P-387.

2. Jackson, A.S. Stanforth, P.R. Gagnon, J. Rankin, T. Leon, A.S. Rao, D.C. Skinner, J.S. Bouchard, C. Wilmore, J.H. (2002). "True"; *International Journal of Obesity*; 26 (6): P-789–96.
3. Stampfer, M.J. Hu, F.B. Manson, J.E. Rimm, E.B. Willett, W.C. (2000). "Heart Disease In Women Through Diet And Lifestyle", *The New England Journal of Medicine*; 343(1): p- 16-22.
4. Hu, F.B. Manson, J.E. Stampfer, M.J. Colditz, G. Liu, S. Solomon, C.G. Willett, W.C. (2001). "*Diet, Lifestyle, and the Risk Of Type 2 Diabetes Mellitus in Women*";*The New England Journal of Medicine*; 345 (11): 790–797.
5. Uppal, A.K. (2001), Principles of Sports Training, Friends Publication (India). P- 51.
6. Kamlesh .M. L, (2007), Methodology of Research In Physical Education and Sports, (Third Edition), Metropolitan Book Co.(P) Ltd. New-Delhi -2 (India).
7. Mathew, D.K. and Fox, E. L. (1971), Physiological Basis of Physical Education and athletics, Philadelphia: W. B. Saunders Co. USA.
8. Gavin, R.H.S. Paul, D. B. and David A. B. (2005), Effects of Exercise on Heart Rate Variability: Inferences from Meta-Analysis, *Medicine & Science in Sports & Exercise*, P-433-439. DOI: 10.1249/01.MSS.0000155388.39002.9D
9. M. Sudhakar Babu, Paul Kumar, P. P. S (2013). The Effect of Selected Circuit Training Exercises on Sprinters of High School Girls, *International Journal of Science and Research*; Vol.2; Issue.11. P-401-407.
10. Phyllis, K. S. Ali, A. E. Peter, P. D. Robert, E. K. Jeffrey, N. R. (1999), Effect of exercise training on heart rate variability in healthy older adults, *American Heart journal*; 138(3), P-567-576.

How to cite this article: Sil P. Effect of six weeks circuit training on resting heart rate among active adult women. *Int J Res Rev.* 2015; 2(6):379-382.

\*\*\*\*\*