

Online Available at [www.thepharmajournal.com](http://www.thepharmajournal.com)

## THE PHARMA INNOVATION

# Effect of circuit training on systolic blood pressure of Annamalai University Students

Dr. W Vinu

Assistant Professor, Department of Physical Education & Sports Sciences, Annamalai University, Tamil Nadu, India

The purpose of the study is to find out the effects of circuit training on systolic blood pressure. fifteen (N=15) men studying in Annmalai University Tamilnadu, India were randomly selected as subjects. The age, height and weight of the subjects ranged from 18 to 21 years, 162 to 171 cms and 60 to 68 kg respectively, and the standard deviations were 0.14, 0.06, and 0.09 kilograms respectively.

Subjects selected (n=15) underwent Circuit Training for twelve weeks. A written consent was also obtained from the subjects. However, they were free to withdraw their consent in case they felt any discomfort during the period of their participation. There were no such dropouts in this study.

The data collected from the subjects prior to and immediately after the training programme on the selected criterion variables were statistically analysed with dependent 't' test the dependent 't' test values between the pre and posttest means of Circuit Training is 4.14 respectively. Since the obtained 't'-test value of subject is greater than the table value 2.15 with df 14 at .05 level of confidence, it is concluded that Circuit Training have registered significant improvement in performance of Systolic Blood Pressure.

**Keyword:** Systolic blood pressure, circuit training

### INTRODUCTION

Circuit training is a method of physical conditioning that employs both apparatus resistance training and calisthenics' conditioning exercises. It provides a means of achieving optional fitness in a systemized controlled fashion. The intensity and vigor of circuit training are indeed challenging and enjoyable to the performer. The system produces positive changes in motor performance, general fitness, muscular power, endurance and speed (Aruheim, 1987).

Corresponding Author's Contact information:

D Rr. W Vinu\*

Assistant Professor, Department of Physical Education & Sports Sciences, Annamalai University, New Delhi, Delhi,

---

India

E-mail: drvirendra.upadhyay@gmail.com

---

### Systolic Blood Pressure

The pressure exerted on the vessel walls during ventricular contraction, measured in millimeters of mercury by the sphygmomanometer (Howley and Franks, 1997).

Systolic pressure is the highest arterial pressure measured during a cardiac cycle. It is the pressure in the artery after blood has been ejected from the left ventricle.

### Methodology

The purpose of the study is to find out the effects of circuit training on systolic blood pressure.

fifteen (N=15) men studying in Annamalai University Tamilnadu, India were randomly selected as subjects. The age, height and weight of the subjects ranged from 18 to 21 years, 162 to 171 cms and 60 to 68 kg respectively, and the standard deviations were 0.14, 0.06, and 0.09 kilograms respectively. Subjects selected (n=15) underwent Circuit Training for twelve weeks. A written consent was also obtained from the subjects. However, they were free to withdraw their consent in case they felt any discomfort during the period of their participation. There were no such dropouts in this study.

### **Selection of Variables**

#### **Dependent Variables**

The dependent variables selected in this study was Systolic blood pressure

### **Training programme**

During the training period, the experimental group has undergone the training programme as given in table- 1

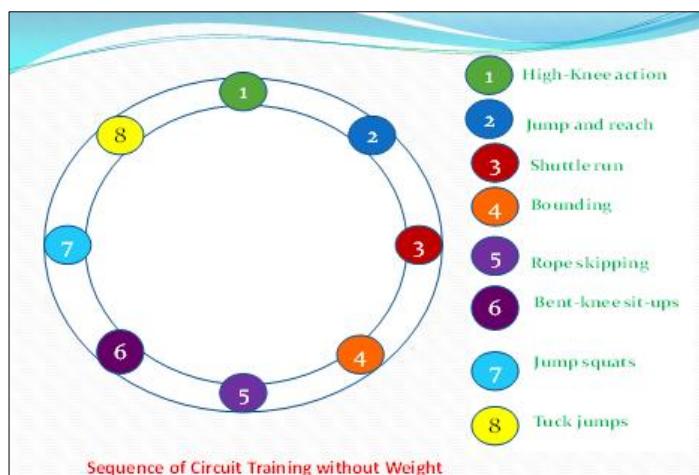
### **Circuit Training**

The researcher selected eight exercises and fixed them as stations High Knee Action, Jump and Reach, Shuttle run, Bounding, Rope Skipping, Bent Knee Sit-ups, Jump Squats and Tuck Jumps to be carried out by the subjects and the same is shown in Figure-I.

**Table 1:** Training Intensity for Circuit Training

<b>Week</b>	<b>Duration of Exercises (in Seconds)</b>	<b>Number of Circuits</b>	<b>Recovery Time between Circuit (in Minutes)</b>
I-II	40	2	5
III-IV	40	2	4
V-VI	45	2	5
VII-VIII	45	2	4
IX-X	50	3	5
XI-XII	50	3	4

As per the table above, total training period has been allotted to twelve weeks. Duration of each exercise per circuit varied from 40 to 50 seconds, number of circuits for these twelve weeks also varied from two to three. Recovery time taken between circuits also varied from four to five weeks.



**Fig 1:** Circuit Training Exercises

## Collection of Data

The data were collected from all subjects during their resting conditions

## Selection of Test

### Systolic blood pressure Purpose

The purpose is to measure systolic blood pressure.

## Equipment

A dial type of Sphygmomanometer and stethoscope, a chart and a table were used for recording the blood pressure.

## Procedure

The blood pressure for the subjects was taken in the morning session. Each subject was given adequate time to relax in a seat in a comfortable position to maintain the normal blood pressure. The blood pressure for all the subjects were taken in a systematic manner for which the subject's right arm was completely made bare to make certain that clothing did not press the blood vessels. The Sphygmomanometer was kept at the level of the heart to avoid any gravitational influences.

The blood pressure measurement was taken with the subject in a relaxed position on the table. The cuff was wrapped around the arm evenly with the lower edge approximately one inch above the antecubital space. The stethoscope was placed firmly over the artery in the antecubital space. It was made sure that stethoscope was free from contact with the cuff. The cuff was inflated until the artery fully collapsed to the extent that no pulse beat could be heard.

Pressure was then released by releasing the knob slowly as the investigator watched the gauge. When the first sound of the pulse became audible, the reading in millimeters of mercury at the instant was recorded as systolic blood pressure.

## Scoring

The reading in the blood pressure apparatus at which the sound was first heard was taken as systolic blood pressure.

## Statistical Technique

The data obtained from the experimental group before and after the experimental period were statistically analyzed with dependent 't'-test.

## Systolic Blood Pressure

The analysis of dependent 't'-test on the data obtained for Systolic Blood Pressure of the subjects in the Pre-test and Post-test of experimental group and control group has been presented in Table II.

## Result

**Table 2:** The summary of mean and dependent 't' test for the pre and post tests on systolic blood pressure of experimental group

Pre- test mean	125.73	t- test	4.14*
Post-test mean	121.73		

\* Significant at .05 level.

(Table value required for significance at .05 level for 't'-test with df 14 is 2.15)

## Result

From table II it is learnt that the dependent 't' test values between the pre and posttest means of Circuit Training is 4.14 respectively. Since the obtained 't'-test value of experimental groups is greater than the table value 2.15 with df 14 at .05 level of confidence, it is concluded that Circuit Training have registered significant change on systolic blood pressure.

## References

1. Aruheim Danial D. Essential of Athletic Training, Saint Louis: Toronto Santa Clara: Times Mirror/Mosby College Publishers, 1987.
2. Baumgartner Ted A, Andrew Jackson S. Measurement for Evaluation and Exercises Science, (3<sup>rd</sup>), Dubuque: Brown Publishers, 1987.
3. Bucher Charles A, William Prentice E. Fitness for College and Life, Saint Louis: Toronto Santa Clara: Times Mirror/Mosby College Publishers, 1985.
4. Butterfield G. Amino acids and high protein diets. In Lamb D, Williams M(editors), Perspectives in exercise science and sports medicine, Ergogenics, enhancement of performance in exercise and sport (pages 87-122). Indianapolis, Indiana: Brown & Benchmark, 1991, 4.
5. Clarke Harrison H. Research Process in Physical Education (2<sup>nd</sup> Edn), Englewood Cliffs, New Jersey: Prentice- Hall Inc, 1975.
6. Edward Howley T, Don Franks B. Health Fitness Instructions Hand Book (3<sup>rd</sup> edn), Illinois: Human Kinetic Publishing Limited, 1997, 69.
7. Fox Edward L *et al.* Physiological Basic of Physical Education and Athletics, IOWA: Brown Publishers, 1989.
8. Johnson Perry, Donald Stolberg. *Conditioning* New Jersey: Prentice-Hall Inc, 1971.
9. Mathews Donald K. Measurement in Physical Education, Philadelphia: W.B. Saunders Company, 1971, 139.
10. Rall LC, Roubenoff R, Harris TB. Albumin as a marker of nutritional and health status. In: Rosenberg IH (ed): Nutritional Assessment of Elderly Populations, Bristol-Myers Squibb/Mead Johnson Nutrition Symposia, New York: Raven Press, 1995, 13.
11. Shaver Larry G. *Essentials of exercise physiology* New Delhi: Delhi Publication Company, 1982.
12. Singh Hardayal. Sports Training, Patiala: Netaji Subash National Institute of Sports Publishers, 1984.
13. Alcaraz PE, Perez-Gomez J, Chavarrias M, Blazevich AJ. Similarity in adaptations to high-resistance circuit vs. traditional strength training in resistance-trained men. *J Strength Cond Res.* 2011; 25(9):2519-2527.
14. Alcaraz Pedro E, Sanchez-Lorente Jorge, Blazevich Anthony J. Physical Performance and Cardiovascular Responses to an Acute Bout of Heavy Resistance Circuit Training versus Traditional Strength Training. *Journal of Strength & Conditioning Research.* 2008; 22(3):667-671.
15. Bos Cecile, Robert Benamouzig, Anne Bruhat, Christian Roux, Sylvain Mahe, Paul Valensi *et al.* Short- term protein and energy supplementation activates nitrogen kinetics and accretion in poorly nourished elderly subjects. *The American Journal of Clinical Nutrition.* 2000; 71:1129-1137.
16. Brentano MA, Cadore EL, Da Silva EM, Ambrosini AB, Coertjens M, Petkowicz R *et al.* Physiological adaptations to strength and circuit training in postmenopausal women with bone loss. *J Strength Cond Res.* 2008; 22(6):1816-1825.
17. BrideMc JM *et al.* Effect of resistance exercise on free radical production. *Medi. Sci. Sports Exerci.* 1998; 30(1).