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# Impacts of circuit resistance training on physical variables of college level high and long jumpers

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**Abstract**
The aim of this study was to discover out the impacts of circuit resistance training on physical variables of college level high and long jumpers. For the purpose of the study 60 subjects were assigned in to two group's namely experimental group (EG) and control group (CG). The subject's age ranged between 20 to 24 years. Subjects in the group I experimental group (EG) performed a circuit resistance training program three days per week of training for a total of seven weeks. Group II acted as control group (CG), the subjects in control group were not engaged in any training program other than their regular work. The following variables were determined before and after training: Speed, Muscular strength endurance. All variables were found to significantly improve ($p < 0.05$) in response to the training programs. These data indicate that, a circuit resistance training program using instability training devices is as effective in school level high and long jumpers as a program executed under stable conditions for improving Speed, Muscular strength endurance. The subjects were free to withdraw their consent in case of feeling any discomfort during the period of their participation but there were no drop outs during the study.

**Keywords:** Circuit Training, Speed, Muscular Strength Endurance.

## 1. Introduction
Circuit training is a form of body conditioning or resistance training using high-intensity aerobics. It targets strength building and muscular endurance. An exercise "circuit" is one completion of all prescribed exercises in the program. When one circuit is complete, one begins the first exercise again for the next circuit. Traditionally, the time between exercises in circuit training is short, often with rapid movement to the next exercise.
Baylor University and The Cooper Institute show that circuit training is the most time efficient way to enhance cardiovascular fitness and muscle endurance. Studies show that circuit training helps women to achieve their goals and maintain them longer than other forms of exercise or diet.

### Morgan and Anderson claim
"Perhaps a most profound finding of this study, from a health perspective, is that this investigation clearly shows that performance of this circuit of exercises, this level of intensity elicited oxygen consumption values (39% to 51.5% of VO2max) that meet established guidelines of the American College of Sports Medicine (ACSM) for the recommended intensity (40% to 85% of VO2maxR) of exercise for developing and maintaining cardio-respiratory fitness. Thus, this circuit not only provides a suitable muscular fitness stimulus but also helps to meet ACSM cardiovascular guidelines and the newly published Dietary Guidelines for Americans 2005 for physical activity."
One disadvantage is that reduced station times will encourage the participants to lift heavier weights, which means they can achieve overload with smaller number of repetitions: typically in the range of 25 to 50 depending on their training goals.
Strength training is a type of physical exercise specializing in the use of resistance to induce muscular contraction which builds the strength, anaerobic endurance, and size of skeletal muscles.
When properly performed, strength training can provide significant functional benefits and improvement in overall health and well-being, including increased bone, muscle, tendon and

ligament strength and toughness, improved joint function, reduced potential for injury, increased bone density, increased metabolism, increased fitness, improved cardiac function, and improved lipoprotein lipid profiles, including elevated HDL ("good") cholesterol. Training commonly uses the technique of progressively increasing the force output of the muscle through incremental weight increases and uses a variety of exercises and types of equipment to target specific muscle groups. Strength training is primarily an anaerobic activity, although some proponents have adapted it to provide the benefits of aerobic exercise through circuit training.

Sports where strength training is central are bodybuilding, weightlifting, power lifting, strongman, Highland games, shot put, discus throw, and javelin throw. Many other sports use strength training as part of their training regimen, notably American football, wrestling, track and field, rowing, lacrosse, basketball, pole dancing, hockey and football. Strength training for other sports and physical activities is becoming increasingly popular.

**Methodology**

The aim of this study was to discover out the impacts of circuit resistance training on physical variables of college level high and long jumpers. For the purpose of the study 60 subjects were assigned in to two group's namely experimental group (EG) and control group (CG).. School level boys were randomly selected from Vaish College, Rohtak, Haryana. The age of the selected subjects ranged between 20 to 24 years. They were divided into two equals groups. The researcher did not made any attempt to equate the group. The experimental group was treated with circuit resistance training for three days per week for a period of seven weeks and control group was not given any treatment.

To carry out the study the researcher used two groups, Experimental group (EG) and Control group (CG) each group consists of 15 subjects. Both the groups were tested on selected criterion variables and the readings were recorded in their respective units, as pre-test scores. After pre-test Experimental group (EG) was treated with circuit resistance training for a period of seven weeks. After seven weeks of training both the groups were tested again on the selected criterion variables and the scores were recorded in their respective units as post test scores. The pre and post test were taken for analysis.

**Results and Discussion**

The data collected on athletes were statistically processed and discussed on the effects of circuit resistance training on physical variables of school level high and long jumpers were statistically processed and discussed.

**Table 1:** Computation of 't' ration between pre and post test means of experimental group and control group on speed

| | Pre | | Post | | | |
|---|---|---|---|---|---|---|
| **Group** | **Mean** | **S.D** | **Mean** | **S.D** | **Mean Diff.** | **'t' Ratio** |
| Experimental | 8.317 | 0.639 | 7.216 | 0.482 | 1.101 | 5.23 |
| Control | 8.598 | 0.690 | 8.872 | 0.513 | 0.274 | 2.37 |

*Significant 0.05 level of confidence (2.14)

The analysis of the table-1 clearly reveals that, the obtained't' ratio of circuit resistance training, the calculated t-value was 5.23 and 2.37 respectively. It had a significant effect in improving Speed at 0.05 levels. The increase in speed from pre to post training for the circuit resistance training group were significantly higher than the control group. 't' ratio required to be significant at 0.05 level was 2.14.

**Table 2:** Computation of 't' ration between pre and post test means of experimental group and control group on muscular strength endurance

| | Pre | | Post | | | |
|---|---|---|---|---|---|---|
| **Group** | **Mean** | **S.D** | **Mean** | **S.D** | **Mean Diff.** | **'t' Ratio** |
| Experimental | 2.85 | 0.16 | 2.94 | 0.09 | 0.17 | 4.82 |
| Control | 2.78 | 0.24 | 2.69 | 0.09 | 0.274 | 2.29 |

*Significant 0.05 level of confidence (2.14)

The analysis of the table-1 clearly reveals that, the obtained 't' ratio of circuit resistance training, the calculated t-value was 4.82 and 2.29 respectively. It had a significant effect in improving Speed at 0.05 levels. The increase in muscular strength endurance from pre to post training for the circuit resistance training group were significantly higher than the control group. 't' ratio required to be significant at 0.05 level was 2.14.

**Discussions on Findings**

The present study experimented that, the effect of circuit resistance training on physical variables of school level high and long jumpers. The result of this study indicated that, the circuit resistance training improves the physical variables such as Speed, Explosive Power, and Muscular Strength endurance. The findings of the present study had similarity with the findings of the investigations referred in this study.

**Conclusion**

From the results of this study, the following conclusions were drawn that, there was a significant mean difference on Circuit Resistance Training on Speed of school level high and long jumpers and there was a significant mean difference on Circuit Resistance Training on Muscular Strength Endurance of school level high and long jumpers.

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