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# Effects of Circuit Training on the Speed and Agility of Hockey Players

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***Abstract:*** *The purpose of this research study was to study the effects of circuit training on the speed and agility of hockey players. As subjects in this research study, different schools in hockey coaching were selected. A total of* 40 *players were selected as subjects in this research study,* 20 *players in the circuit exercise training group and* 20 *players in the control group. The standard of measurement was speed measurement by running* 50 *times and agility measurement by shuttle run and analysis of variance, covariance (ANCOVA) was applied to the obtained data of experimental group and control group and significance was tested at* 0.05 *level. The findings of which were seen as follows.* 12*-week circuit exercise training program showed significant improvement in subjects' speed.* 12*-week circuit exercise training program showed significant improvement in subjects' agility.*

***Key Words:*** *Speed, agility, exercise training, hockey players.*

## 1. INTRODUCTION :

The term 'Training' has remained a part of human language since ancient times, which indicates preparation of beginning any work. The process goes on for days, months and years. The word 'training' is widely used in sports. Coaches of sports and sports scientists differ to the true meaning of training. Some experts take it as connected to medical science and consider sports and games as training. They consider training as physical exercises, e.g. strength training, interval training, physical exercises, maneuver etc. There is no guarantee of increase or development in performance by its regular and gradually practice. Some other aspects such as sports tools, materialistic vision, reparation, tools of performance and evaluation, projection and psychological tools should also be taken into consideration in order to attain better results. So, training should be provided to individual by co-ordination of process of preparation and other causative aspects. Beside these tools, other sport sciences such as medical science, sports science, dietetics, physical treatment, sports psychology, sports biopsychology etc are also helpful for advance training. So it can be concluded when the role of theoretical is less and training is more, the performance of players will be more natural.

Circuit training is very important for development of elements necessary for muscular fitness. Trainee has to do 8 to 12 exercises in this circuit training. The cycles for each type of exercise are also fixed. The sequence of exercises is also fixed. The resting time after finishing one exercise is also fixed. After completing the first exercise, 8 to 12 exercises are to be taken in sequence of second, third and next without stopping for a while. In this way, one cycle of circuit training is completed. Generally, three to five cycles are planned according to need of the players in the circuit training. After the player had finished the first cycle, the rest is given according to training weightage. Weight lifting exercises, other obstructive exercises, calisthenics, race, swimming or stretching exercises etc. are included in the circuit training.

To form the structure of the circuit training, the coach measures characteristics of physical fitness of layers by giving a physical fitness test and decides which competencies they lack. Then, the coach constructs the training programme for development of lacking competencies. For example, if the coach sees less strength of shoulder muscles, he will include the exercise helpful to increase the strength of shoulder muscles in the circuit training. If the coach finds

less speed, one or two exercises for increasing speed will be selected. In the same way, if developing the muscles of thigh or abdomen, some exercises for development of muscles of thigh or abdomen can be selected. Thus, one or two exercises for muscular power, flexibility, endurance etc are to be included in the circuit training and the structure of the training programme is prepared. Selections of exercises, exercise cycles, duration of training, density of exercise etc. are to be determined while preparing structure for the circuit training.

Speed is the ability of a person to perform a certain type of motion continuously in minimum time. Speed is the number of motions during a given unit of time. E.g. Speed is the number of constant motions of the legs during a given unit of time in fast running. Other actions include Other factors also contribute to success. Muscular strength and speed are closely related. Success in fast running cannot be achieved without the muscle strength required for fast leg movement. Along with thinking about muscle strength and speed etc., many real sports skills have an element of speed. E.g. Basketball, Football, Baseball etc.

Agility is a person's ability to change position. E.g. Agility in football also includes the ability to change direction, which is important in sports such as football, basketball, hockey, softball, etc. Speed is an important requirement in agile work. A person who can transition from one position to another with maximum speed and consistency has a high degree of agility. Agility also requires strength and endurance.

## 2. Objective of Study :

The purpose of this research study was to study the effects of circuit training on the speed and agility of students.

## 3. Selection of Subject :

As subjects in this research study, C. U. Students from Shah Science College, Ashram Road, Ahmedabad were selected. A total of 40 students were selected as subjects in this research study, 20 students in the circuit exercise training group and 20 students in the control group.

## 4. Criterion Measure :

| Sr. No. | Variable | Test | Measurement |
|---|---|---|---|
| 1 | Speed | 50 Yard Run | Time |
| 2 | Agility | Shuttle Run | Time |

## 5. Statistical Procedure :

The significance was tested at 0.05 level by applying analysis of variance, covariance (ANCOVA) on the obtained data of experimental group and control group.

## 6. Result of the study :

**Table - 1**

**Covariance analysis of variance of an experimental and a control group of speed test performance**

| Test | Group | | Sum of Square | | Degree of Freedom | Mean )MSS( | *F* |
|---|---|---|---|---|---|---|---|
| | Circuit Training | Control | | | | | |
| Pre-Test Mean | 10.65 | 10.88 | B | 0.17 | 1 | 0.17 | 0.39 |
| | | | W | 17.37 | 38 | 0.45 | |
| Post-Test Mean | 10.05 | 10.87 | B | 6.06 | 1 | 6.06 | 16.84* |
| | | | W | 14.41 | 38 | 0.37 | |
| Adjusted Mean | 10.09 | 10.92 | B | 5.07 | 1 | 5.07 | 18.79* |
| | | | W | 10.50 | 37 | 0.28 | |

***Significant Level *'F'* = 0.05 (1,38) = 4.098 & (1,37) = 4.105**

In Table-1 the pre-test 'F' ratio was found to be 0.39. Which was found to be insignificant at 0.05 level. While the 'F' ratio of the final test of both teams was found to be 16.84. which was found to be significant at 0.05 level and the corrected mean 'F' ratio was found to be 18.79. Which was found to be significant at 0.05 level.

**Table - 2**
**Covariance analysis of variance of an experimental and a control group of agility test performance**

| Test | Group | | Sum of Square | | Degree of Freedom | Mean )MSS( | *F* |
|---|---|---|---|---|---|---|---|
| | Circuit Training | Control | | | | | |
| Pre-Test Mean | 12.42 | 12.58 | B | 0.36 | 1 | 0.36 | 0.85 |
| | | | W | 15.47 | 38 | 0.40 | |
| Post-Test Mean | 12.23 | 12.68 | B | 1.88 | 1 | 1.88 | 5.32* |
| | | | W | 16.66 | 38 | 0.43 | |
| Adjusted Mean | 12.33 | 12.60 | B | 0.74 | 1 | 0.74 | 6.38* |
| | | | W | 5.09 | 37 | 0.13 | |

***Significant Level *'F'* = 0.05 (1,38) = 4.098 & (1,37) = 4.105**

The 'F' ratio of the pre-test was found to be 0.85 in Table-2. Which was found to be insignificant at 0.05 level. While the final test 'F' ratio of both teams was found to be 5.32. Which was found to be significant at 0.05 level and 'F' ratio of corrected mean was found to be 6.38. Which was found to be significant at 0.05 level.

## 7. Conclusion :

- 12-week circuit exercise training program showed significant improvement in subjects' speed.
- 12 week-long circuit exercise training program showed significant improvement in subjects' agility.

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