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Relationship of plyometric and circuit training with explosive strength and agility of Punjab state basketball players

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Abstract

The purpose of this study was to show the relationship in Plyometric and Circuit training on Explosive Strength and Agility of Punjab state Basketball players. The study was delimited to one hundred twenty male basketball players from Punjab. The age of the players ranged from 12 to 16 years. The Explosive Strength and Agility were measured before, mid three-week training period and after six-week training period. The players of Experimental group were trained for six days per week on alternative days (Plyometric Training on Monday, Wednesday and Friday whereas Circuit Training on Tuesday, Thursday, and Saturday). The Explosive strength was measured through standing long jump, Agility was measured through shuttle run 10×10 yards before, mid and after a six-week training period. Correlation of the variables was calculated. However, Experimental Group showed a sign of improvement than control group in criterion variables. Results of this study showed significant difference between pre-test, mid-test and post-test of Experimental group on dependent measurements ($p < 0.05$).

Keywords: Plyometric training, circuit training, explosive strength, agility

Introduction

Some players seek to win a competition or improve previous performance; others consider gaining a technical skill or further developing a bio-motor ability. So, training is a process by which a player is prepared for the highest level of performance possible. Players practice to achieve a specific goal through structured and focused training. Training is an important activity which improves physical performance of the individual or a group. When we are talking about physical performance, it means sports performance and performance of our body to sustain our daily routine life. This shows that player's performance is important for the performance of the organization and the training and development is beneficial for the players to improve their performance. The intent of training is to increase the player's ability and work capacity to optimize player's performance.

Plyometric training

Plyometric exercises involve quick, explosive movement designed to increase speed and power. The goal of plyometric exercises is to decrease the amount of time in-between these two movements, an athlete can become faster and more powerful. Plyometric exercises are used mainly to increase the maximal power output and jumping ability. It includes training loads with a number of rebounds and intervals between sets of exercises and drills. In plyometric training, athletes perform stopping, starting and changing direction in an explosive way, which helps to improve agility. One of the most effective mean of training for power is through plyometric training. It is not so surprising then, to see that the athletes who train with plyometric are normally the better sports person because they are much more explosive than their counterpart. The training method is also getting popular among people who want variety in their workout routine. It offers performance improvement in almost all sports. Plyometric training is also reducing lower-extremity injuries and crossed over into the rehabilitation field.

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Circuit training

Circuit training is an excellent way to simultaneously improve mobility and build strength and stamina. The circuit training is a form of training that is enjoyable, measureable and generates immediate positive changes in all fitness components. The intensity and vigour circuit training exercises challenges and motivates the sportspersons, thus making against teammates and against time. It stimulates and maintains interest of its competitive element. Circuit training method is certainly to be an excellent form of intensive multi-purpose conditioning for most sports. No exercise can develop both strength and endurance equally well at the same time and it is for this reason that general fitness training circuit should include some exercises which can for many repetition with comparatively light resistance that allows only a few repetitions in order to increase muscular strength.

Explosive strength

Explosive strength finds expression in motor movement. A high percentage of movements in sports are of explosive nature and involves overcoming of some external or of one's own body weight. Explosive strength therefore, is important in most of sports. It is shown clearly in activities such as throwing and jumping when athletes attempt to project them or an object as fast as possible. Explosive strength is readily measureable leg strength or power can be assessed either by a vertical leap or a standing broad jump.

Agility

An agile movement is one that flows freely. Learn to change direction quickly and easily. Agility enables the athlete to change the position of his body quickly and easily. Agility is important for evading a tackler in Foot Ball, dodging in Basketball and Hockey, and turning at the end of Swimming Lane ^[1]. Agility refers to the manoeuvrability of the individual, i.e., the ability to change the direction of movement rapidly, without less of balance or sense of position. It is therefore, a combination of speed, strength quick reactions, balance and coordination and can refer to the total body or to a specific part, such as the hands or feet.

Objective of the present study

To find the relationship in plyometric and circuit training on explosive strength and agility of Punjab State Basketball players.

Methodology and Procedure

Sample: To achieve the objectives of the study, 120 male basketball players of Punjab were taken. All subjects who have participated at Inter District Competition; age ranging from 12 to 16 years would be selected randomly. The sample of 120 male players was divided into four groups each including 30 male players. Every group is divided into two sub-groups, Group I as Experimental Group (EG) and group II as Control Group (CG). There were 30 male players in each group (15 in Experimental Group and 15 in Control Group). Experimental group went through Plyometric and Circuit Training for one hour, after 15 minutes of warm-up and stretching exercise, for six weeks. The data would be collected by the pre- test (T1), mid-test (T2) after three weeks and the post-test (T3) after Six-week of training programme.

Selection of Variables: The performance of basketball players is mainly concerned with the Explosive Strength and Agility. The overall playing ability aspects have to be considered as the major factors since these aspects have functional association with one another. The earlier studies on basketball substantiated clearly its nature and importance. Based on the earlier studies, the opinion of the experts and the need of the study, the following variables had been selected for the study:

1. Explosive strength
2. Agility

Training Schedule: The training schedule for Experimental Group has been given in the form of indicating the intensity, repetitions and set. The subjects of Group-I (Experimental group) was restricted with Plyometric and Circuit Training for one hour for three days each in a week on alternate days continued for six days. Plyometric Training would be carried out on Monday, Wednesday and Friday whereas Circuit Training on Tuesday, Thursday and Saturday.

Statistical Techniques: For analysis of the data collected from pre-test, mid-test and post-test of Experimental Group and Control Group of basketball players. For this purpose Correlation (r) was applied and for testing the hypotheses, the level of significance was set at 0.05%.

Analysis of tables and discussion

Table 1: Correlation among Pre-test, Mid-test and Post-test between Experimental and Control Group in Explosive strength

Group	Pre-test (r)	Mid-test (r)	Post-test (r)
Explosive strength	0.17	0.19	0.06

Table 1 shows the significant correlation among Pre-test, Mid-test and Post-test between Experimental and Control Group in Explosive Strength are ($r=0.17$; $p>0.05$), ($r=0.19$; $P>0.05$) and ($r=0.06$; $P>0.05$) respectively. From the computed value, it can be interpreted that there is a significant low positive relationship (between 0 to +0.25) between Experimental and Control Group in Explosive Strength of Punjab state basketball players.

Thus the hypothesis, "There will be no significant relationship in pre-test, mid-test and post-test between Experimental and Control Group of Explosive Strength of Punjab state basketball players" is accepted.

Table 2: Correlation among Pre-test, Mid-test and Post-test between Experimental and Control Group in Agility

Group	Pre-test (r)	Mid-test (r)	Post-test (r)
Agility	0.05	0.05	-0.20

Table 2 represents the correlation among Pre-test, Mid-test and Post-test between Experimental and Control Group in Agility are ($r=0.05$; $p>0.05$), ($r=0.05$; $P>0.05$) and ($r=-0.20$; $P>0.05$) respectively. From the computed value, it can be interpreted that there is a significant low positive relationship in pre-test and mid-test (between 0 to +0.25) and low negative relationship in post-test (between 0 to -0.25) between Experimental and Control Group in Agility of Punjab state basketball players.

Thus the hypothesis, "There will be no significant relationship in pre-test, mid-test and post-test between Experimental and Control Group of Agility of Punjab state basketball players" is accepted.

¹C. A. Bucher, Physical Education for Life (New York; Mcgraw-Hill Book Company), pp.43.

Findings and conclusion

1. There will be no significant relationship in pre-test, mid-test and post-test between Experimental and Control Group of Explosive Strength of Punjab state basketball players” is accepted.
2. There will be no significant relationship in pre-test, mid-test and post-test between Experimental and Control Group of Agility of Punjab state basketball players” is accepted.

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