ISSN: 2349 - 4891

International
Journal of Recent Research and Applied Studies
(Multidisciplinary Open Access Refereed e-Journal)

Effect of Varied Intensities and Frequencies of Plyometric Training on the Performance of Selected Athletic Events in School Boys

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Received 2nd February 2016, Accepted 1st April 2016

Abstract

The purpose of this study was to investigate the effect of varied intensities and frequencies of plyometric training on the performance of selected athletic events in school boys of sixteen to eighteen years of age. To facilitate the study, forty five school students of Government higher secondary school, Pottireddipatti, Namakkal were selected at random as subject and were divided in to three group namely control group, three days per week training group and four days per week training group. Participated in the plyometric training programme for a period of six weeks. During this period, the control group was not given any training. The data were collected on the selected athletic events, namely 100 meters dash, long jump and shot put respectively before training (pre-test) as well as after six weeks training (post test). The intensities of plymetric training was given to experimental group I three days in a week for 6 weeks while sixty percent intensities of plyometirc training was given to the experimental group II for four days in a week seventy percent intensities. The initial variable scores (pre test) were taken from the subjects before administrating the plyometric training. The subjects were involved with their respective intensities and frequencies of plyometric training for a period of six weeks under the personal supervision of the research scholar. At the end of six weeks the final scores (post test) were taken. The significance of the difference among the means of experimental group and control group for pre test and means were analysed by F ratio through analysis of variance. Analysis of co variance was used to compute the paired adjusted means. The significance was set at 0.05 level.

Keywords: Plyometric, Athletic Events, School Boys, Varied Intensities.

Introduction

In the modern world the records of track and field are often broken and new records are set thanks to the new techniques and training methods. Through systematic training programmes an athlete can improve. The strength, endurance and agility. So that he can perform better in his athletic event. Training has been a part of human language since ancient times. It denotes the process of preparation for some task. The preparation of a sportsman represents a multisided process of purposeful utility of the total complex of factors, which help in the development of thesports man and ensure an necessary level of his sports performance ability. Sports training aims at achieving high performance in sports competitions. It is a process which is spread over a long period of time and a competitions – cum – performance oriented Endeavour as well. Training programmes in athletics aim directly at the improvement of performance. Plyometrics is the term now applied the exercise that has their roots in Eruope, where they were first known simply as "Jump Training" the actual term plyometrics was first coined in 1975 by Gred Wilt, one of America's more form ward thinking track and field coaches. Based on Latin origins, Plyo-Metrics is interpreted to mean "measurable increases" Plyometric training became essential to athletes who jumped, lifted or throw.

Sports training must be understood as a specialized process of all round physical conditioning aimed at the methodical preparation of athletes. Sports training are the total process of preparation of a sports man, through different means and forms for better performance. The sports performance is the result and expression of the total personality of the sportsman. The educational aspect of sports training is unfortunately over looked frequently by coaches and physical education teachers in India. Uppal (1982)[1] stated that for optimum performance in games and sports, the different components of physical and motor fitness, such as speed, strength, endurance, flexibility and agility are pre-requisites. Unless optimum development takes place in these components a player will not be able to perform at his/her best during training and competitions. Therefore training programme should be so organized that they are geared towards harmonious development of all the

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physical fitness components required for the activity. Sarfoot (1981) stated that high intensity of exertion demanded by modern competitive game call for high levels of endurance to play to the end with un diminishing levels of skills at as at the commencement of the games, when the duration of the game is either increased by regulations as is foot ball or due to need for extending the game when the competitions are highly matched or when duration is to be extended to break the tie, as in tennis, badminton, basketball, volley ball, hockey, foot ball, etc., Thus development of endurance has become one of the training methods for players is any sports. Kunder et al. (1988) stated that the goal of today's tremendous competition in sports is to exhibit one's excellence and to win. There are numerous factors which are responsible for winning a competition. The performance of the sports man in individual or in team game is dependent on the suppleness, skill training, motivation, anxiety, age, sex, physical growth and some physiological and biochemical factors.

The purpose of training programme is to produce metabolic, physiological and psychological adaptation that allow sports persons to perform better when training increases the demand for aerobic energy, the number and size of muscle mitochondria will increase so that these 'Chemical factories' where aerobic metabolism takes place become larger and more numerous. This will enable athletes to provide more energy from aerobic metabolism. There are three steps in the adaptation process. The first step involves creating the need for more aerobic energy. Training must be sufficient in both duration and intensity to accomplish this. The second step is to provide proper nutrients to build and repair mitochondria tissues. The third step is that the athlete must be given enough rest to build and repair those tissues. Finally it will be necessary to increase the duration and intensity of training. This brings forth the first two principles of training over load the progression other load provides a method for producing adaptations while progression ensures that continuous over load takes place. A third principles concern with nature of adaptation.

Training is much like constructing a multistory building. We need various kinds of building materials such as aerobic and anaerobic training comprehensive kinds of building materials such as aerobic and anaerobic training Comprehensive conditioning and flexibility. Several kinds of materials like training intensities and modalities should be utilized are going fashion to complete the goal of a finished building or a cumulatively fit athlete. Depending on the progress is the construction plan, the relative mix of all these materials will vary. As a training season develops is comprehensive conditioning work for strength and endurance will gradually from a transition is to an emphasis on power with a substitution of intensity for volume is determining the total training load. Similar transitions occur with the pattern of sports event.

Methodology

To execute this investigation the research scholar randomly selected forty five school boys from Government higher secondary school, Pottireddipatty, Namakkal District, Tamilnadu belonging to the age groups of 16 to 18 years they were divided in to three equal groups of 15 subjects each and assigned to experimental group I (60% intensity with 3 days frequency), Experimental group II (70% intensity with 4 days frequency) Control group III No specific training for a control group. The requirements of the experimental procedures testing as well as exercise schedules were explained to them so as to avoid any ambiguity of the effort required on their part and prior to the administration of the study, the investigator got the individual consent from each subject.

Selection of the Variables

Independent Variable:

1. 60% Intensity with 3 days frequency of plyometric training.
2. 70% Intensity with 4 days frequency of plyometric training.
3. No specific training for control group.

Dependent Variables

1. 100 Meters performance
2. Long jump performance
3. Shot put performance

Experimental Design

The study was formulated as a random group design consisting of a pre-test and post test. The subjects (n=45) were randomly assigned to three equal groups of fifteen boys each. They groups were divided in to three (I,II and III) equal groups out of this three groups, there was control group and two experimental groups. Group I served as a control group, while group II served as a three days plyometric training group III group served as a four days plyometric training group. The pretest and post were given before starting the training program at the end of the six week respectively. They training programme was administered between 4pm and 5pm. Throughout the training period, the experimental treatment was given for both the experimental groups progressively. The first experimental group did weekly 3 days plyometric training and II experimented group did weekly 4 days plyometric training. ANCOVA statistical technique was adopted to find out adjusted mean differences among the treatment groups. The scheffe's post hoc test was used to find out the paired mean differences.

Results

Table I. Computation of analysis covariance for 100 meters dash among control group, three days plyometric training and four days plyometric training group (Scores in Seconds)

	Control Group N=15	Three days training group N=15	Four days training group N=15	Source of variance	Sum of scores	df	Mean squares	F ratio
Pretest means	12.35	12.38	12.59	B W	1.02 106.52	2 42	0.45 1.22	0.41
Post test means	12.17	10.82	10.01	B W	159.83 96.65	2 42	79.92 1. 11	70.25*
Adjusted post test means	12.10	10.89	9.85	B W	228.83 96.65	2 42	114.14 0.31	348.81*

Table II. Computation of scheffe's post hoc test ordered adjusted final mean differences of 100 meters performance.

Control Group	Three days training group	Four days training group	Mean difference	C.I
12.10	10.89		1.21	0.14
12.10		9.85	2.25	0.14
	10.89	9.85	1.03	0.14

Table II shows the analysed data on 100 meters performance. The pre test means of 100 meters performance were 12.35 for control group 12.38 for three days training group and Four days training group 12.59. The obtained F ratio 0.41 was than the table F ratio 3.097. Hence the pre test was significant at 0.05 level of confidence for the degrees of freedom 2 and 42. The mean difference of control group and experimental group – I, control and experimental group II and also experimental group I and II were 1.21, 2.25 and 1.03 respectively. The Scheffe's confidence interval value was 0.14. Hence all the above three comparison were significant.

Table III. Computation of analysis covariance for long jump among control group, three days plyometric training and four days plyometric training group (Scores in meters)

	Control Group N=15	Three days training group N=15	Four days training group N=15	Source of variance	Sum of scores	df	Mean squares	F ratio
Pretest means	4.45	4.42	4.62	B W	0.83 18.87	2 42	0.42 0.22	1.90
Post test means	4.44	5.10	5.45	B W	15.79 17.80	2 42	7.90 0.20	3.93*
Adjusted post test means	4.50	5.13	5.39	B W	11.66 9.85	2 42	5.83 0.11	53.00*

Table IV. Computation of scheffe's post hoc test ordered adjusted final mean differences of long jump performance.

Control Group	Three days training group	Four days training group	Mean difference	C.I
4.51	5.16		0.65	0.14
4.51		5.40	0.89	0.14
	5.16	5.40	0.24	0.14

The mean difference of control group and experimental group I, control group and experimental group I, control group and experimental group II and also experimental group I and II were 0.65, 0.89 and 0.24 respectively. The Scheffe's confidence interval value was 0.14. Hence all the above three comparison were significant.

Table V. Computation of analysis co-variance for shot put among control group, three days plyometric training and four days plyometric training group (Scores in meters)

	Control Group N=15	Three days training group N=15	Four days training group N=15	Source of variance	Sum of scores	df	Mean squares	F ratio
Pretest means	6.91	6.55	6.60	B W	2.46 114.023	2 42	1.23 2.71	0.42
Post test means	6.92	7.26	7.65	B W	580.14 610.37	2 42	290.1 7.02	41.32*
Adjusted post test means	6.30	7.45	7.95	B W	560.56 398.27	2 42	280.28 4.63	60.53*

Table VI. Computation of scheffe's post hoc test ordered adjusted final mean differences of shot put performance

Control Group	Three days training group	Four days training group	Mean difference	C.I
6.32	7.49		1.17	0.93
6.32		7.79	1.65	0.93
	7.49	7.79	0.48	0.93

The mean difference of control group and experimental group I, control and experimental group II and also experimental group I and II were 0.48, 1.65 and 1.17 respectively. The Scheffe's confidence interval value was 0.93. Hence all the above three comparison were significant.

Conclusions

1. The findings of the study showed that the three days and four days frequencies of plyometric training brings out significant improvement in 100 meter dash, long jump, shot put performance.
2. The four days frequencies plyometric training showed greater significant improvements in 100 meters dash, long jump, shot put performance that three days frequencies plyometric training.

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