



## Impact of combined Plyometric Exercises & Weight Training on Explosive

Ajaiz Ahmad Ganie<sup>1</sup>, Mehboob Ahmad Sheikh<sup>2</sup>, Faisal Sualeh Hayyat<sup>3\*</sup>

<sup>1</sup>Assistant professor Central university Kashmir, <sup>2</sup>Physical training instructor Amarsing College Srinagar, <sup>3</sup>Assistant Director Physical Education, Islamic University of Science & Technology, Awantipora, J&K

**Corresponding Author** Dr. Faisal Suleh Hayyat Assistant Director Physical Education, Islamic University of Science & Technology, Awantipora, Jammu & Kashmir. Email: faisalhayyat007@gmail.com

### Abstract

Enhancement of Explosive Power among volleyball Players was tested using the training plyometric exercises combined with weight training with designed package and schedule on sports training principles. To know the effects the score on the selected variable was measured before and after the training schedule. The statistical significance was checked during the statistical analysis as the effect of the training for the scheduled duration which proves the impact of the training on the selected variable.

**Keywords:** volleyball Players; Explosive Power; plyometric exercises; weight training

### Introduction

Physical conditioning requires a variety of exercises to be generally beneficial, just as good nutrition that requires a careful balance of number of nutrients. There are some basic facts about physical fitness, when applied consciously can make almost any conditioning programme work. Strength is an important base upon which some other qualities are developed. Therefore the main physical quality needed in sports is strength. However close examination of almost all sports, it can be seen that though strength is

definitely important, development of other Parameters is also essential. Degree of muscular strength differs from individual to individual, player to player and activity to activity. The strength test is included in almost all test batteries of the fitness performance. This paper aims to study the contributing effects of plyometric exercises combined with weight training on explosive power among volleyball players.

### Plyometric Training

Plyometrics derives its name from “Plethycin” to increase, combining with isometric. It is a resistance training activity that involves an interaction between muscles and the control. Plyometrics is defined as exercise that enables a muscle to reach maximum strength in a short time possible. For an exercise to be truly plyometric, it must be a movement preceded by an eccentric contraction.

### Weight Training

Training intensity is recognized as the most critical aspect of a conditioning regime. Intensity of training is often synonymous with training load (amount of weight per repetition). Intensity is most easily represented as a percentage of one’s repetition maximum (RM) for an exercise. RM refers to the maximum number of repetition that can be performed with a load.

**Aim of the study**

The purpose of the study is to find out the contribution of plyometric exercises combined with weight training on explosive power among volleyball players.

**Methodology**

The selection of subjects was made at random. Thirty volleyball players from pulwama District of J & K state of India were selected and were divided into two equal groups, namely group ‘A’ and group ‘B’. The group ‘A’ was an experimental group and group ‘B’ was a control group. The experimental group underwent the selected training programme (Plyometric Training combined with Weight Training) for six weeks, whereas the control group did not undergo any training. The initial and final scores of the subjects were recorded before and after the training for comparison.

**Test Administration**

The test “Vertical Jump” was administered to find out the explosive power of the subjects. The highest range of jump reached in height was recorded in centimeters.

**TRAINING SCHEDULE**

**Weight Training**

The subjects were asked to warm up and the maximum weight they can lift between 1 and 10 times were measured. Then they were asked to do as many repetitions as they can with the maximum weight they selected earlier. The 1 RM (Repetition Maximum) was calculated by multiplying the weight times the number of repetitions time 0.025.  $1\text{ RM} = \text{Weight} \times \text{Repetitions} \times 0.025$ . Accordingly the load of the individual subject was fixed for the various exercise routines. The load dynamics of the training is given in the Table I.

**Table - I Load Dynamics of the Weight training**

S. No	weeks	Intensity % 1RM	Exercise Load			
			Front squat	Leg curl	Leg extension	Leg thrust
1	1 & 2	60	30	12	9	30
2	3	70	35	14	10.5	35
3	4	80	40	16	12	40
4	5 & 6	90	45	18	13.5	45

The weight training group underwent a progressive weight training programme for six weeks in the following exercises, aimed at improving leg strength and explosive power.

- a) Back Squat
- b) Leg Curl
- c) Leg Extension
- d) Leg Press

**Plyometric Training**

The Plyometric exercises were performed one in the stairs and two using 22 inch boxes.

**1. Stair climbing exercise**

The load and intensity of the exercises involved in the stairclimbing are given in the Table – II.

**Table – II Load and Intensity of the Stair Climbing Exercises**

Types of Exercise	No. of Weeks	Repetition	Recovery time between repetition(min)
	1 × 2	2	2
	3 × 4	3	2
1. Hopping up and down the Stairs using right leg.	5 × 6	4	2
	1 × 2	2	2
	3 × 4	3	2
2. Hopping up and down the stairs using left leg.	5 × 6	4	2
	1 × 2	2	2
3. Hopping up and down the stairs using both legs	3 × 4	3	2
	5 × 6	4	2

**2. Depth Jump**

For the purpose three wooden boxes of 22 inch height were kept at 3 feet distance from each other and arranged in a straight line. The subjects started the exercise by standing on the box and jump down between boxes 1 and 2 then jumped and climbed on box 2. With another jump he repeated this process till he jumped down from box no.3 and he runs back to box no 1. This process was continued nonstop for the specific time given in the Table-III.

**Table – III Load Intensity of the Depth Jump Exercise**

s. no	No. of weeks	Duration of hour	No. of repetitions	Recovery time
1	1 × 2	2 min	2	2
2	3 × 4	3 min	2	2
3	5 × 6	4 min	2	2

**Statistical Technique**

The data collected from both the groups were statistically analyzed by using ANCOVA. To make adjustment for difference in initial means, the adjusted post means were calculated. The criterion for statistical significance was set at 0.05 level of confidence. Since two groups were involved, whenever the ‘F’-ratio was found to be significant for adjusted post test means. In all the cases to test the significance 0.05 level of confidence was utilized.

**Results of Explosive power**

**Table – IV Analysis of mean differences between pre and post test for the Experimental group and Control group on Explosive power.**

Group	Pre test mean (CM)	Post test mean (CM)	Mean difference
Control	57.73	58.06	0.33
Experimental	57.93	66.53	9.60

The pretest means for Experimental and Control groups were 57.93 and 57.73 respectively, which indicates that the groups were equally good on their pre test performance. This points out that the initial mean difference among the groups were not significant. Referring to table IV, the post test means were 66.53 and 58.06 on experimental group and control groups respectively, showed that the mean gain on the experimental group was due to the effect of plyometric exercises combined with weight training. On the other hand control group does not show any significant difference.

**Table-IV Analysis of co-variance of the means for the Experimental group and the Control group on Explosive power**

Source	Df	Sum of squares	Ms	F ratio
Between group	2	2042.47	1021.24	12.80*
Within group	28	2233.52	79.78	

The statistical Significance was at both the level of confidence. F-ratio was found out using ANCOVA resulted as 12.80, which was significantly higher than the tabulated F-ratio of 3.34 (df 2 and 28) at the 0.05 level of confidence. It was quite evident from the Table-IV, that the mean difference between experimental and control group showed significant difference in their mean. ×

**Conclusion**

From the result of the study, it was found that the designed plyometric exercises combined with weight training has made a significant statistical enhancement in explosive power among the volleyball players which proves the fact that the selected package of training is suitable for developing explosive power for volleyball players.

**REFERENCES**

Bob O’ Connor, Jerry Simmons and Pat O’ Shea, Weight Training Today, (St.Paul West Publishing Company, 1983, 2, 9) | McGown, Carl. (Ed).  
 Science of coaching Volleyball. Campaign, Illinois: Human kinetics publishers, Inc., 1994. | H.Harrison Clarke and David H.Clarke, Advanced  
 Statistics, New Jersey: Prentice Hall Inc., 1984, 32. | Voight and Dserovitch, Eccentric Muscle Training in Sports and Orthopedics, 1984, chapter-4. | William D. McArdle, Frank I. Katich and Victor L. Katich (1991). Exercise physiology energy Nutrition and human performance, LeaFebiger, London. |