



Effect of Varied Intensity of Plyometric Training on Leg Explosive Power among College Men Players

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Abstract

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 competition-cum-performance oriented endeavour as well. Plyometrics is a type of exercise training designed to produce fast, powerful movements, and improve the functions of the nervous system, generally for the purpose of improving performance in sports. The main purpose of the study was to find out the effect of varied intensity of plyometric training on leg explosive power (horizontal and vertical distance) of college men players. To achieve this purpose, sixty volley ball players studying in college were randomly selected as subjects, Age ranged from 18 to 25 years. The selected subjects were divided into four equal groups of fifteen subjects each at random. Pre and Post test scores are collected for vertical and standing broad jump. Analysis of covariance (ANCOVA) was used to find out the significant differences.

Keywords: Plyometric Training, Leg Explosive power, Aerobic endurance events, VJ & SBJ.

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Introduction

One of the most exciting and rewarding aspects of life is the experience of going beyond what were once thought to be limitations. We begin to realize that many of our beliefs that impose serious limitations what can or cannot be done on us are simply preconceived restrictions and attitudes taught to us by parents, teachers and others during formative years. The field of sports and games is no exemption tops this. None of our ancestors would have predicted or even dreamt of the techniques applied, the equipment utilized, the performance achieved and the training methods followed by the present athlete, which are the result of systematic and continuous research. It is a process which is spread over a long period of time and a competition-cum-performance oriented endeavour as well. Plyometrics is a type of exercise training designed to produce fast, powerful movements, and improve the functions of the nervous system, generally for the purpose of improving performance in sports. Plyometric movements, in which a muscle is loaded and then contracted in rapid sequence, use the strength, elasticity and innervations of muscle and surrounding tissues to jump higher, run faster, throw farther, or hit harder, depending on the desired training goal. Plyometric trainings is used to increase the speed or force of muscular contractions, often with the goal of

increasing the height of a jump, (Will and Freeman, 1984).

The following are identified as the main objectives of the study,

1. To impart and identify the effect of plyometric training on leg explosive power of college Volley-Ball players.
2. To determine the optimum requirements of plyometric training for the best performance by varied intensities and frequencies.
3. To study the changes in the selected dependent variables of the study.

Methodology

The main purpose of the study was to find out the effect of varied intensity of plyometric training on leg explosive power (horizontal and vertical distance) of college men players. To achieve this purpose, sixty volley ball players studying in college were randomly selected as subjects who have given their consent to participate in the study. The age of the selected subjects were ranged from 18 to 25 years. The selected subjects were divided into four equal groups of fifteen subjects each at random.

- Group I underwent high intensity plyometric training for twelve weeks - three days in a week.
- Group II underwent medium intensity plyometric training for three days in a week.

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- Group III underwent low intensity plyometric training for three days in a week.
- Group IV acted as a control group that did not participated in any of the special training program, apart from their regular practice of volley ball.

Analysis of covariance (ANCOVA) was used to find out the significant differences if any, among the groups for each variable separately. The Scheffe's test was applied as post-hoc test whenever the "F" ratio of the adjusted post test means were found to be significant t at 0.05level of confidence.

Results

Table I. Analysis of covariance of the data on the Leg Explosive power (vertical jump) of pre-test and post-test scores of high intensity, medium intensity, low intensity and control groups

Test	High Intensity Group	Medium Intensity Group	Low Intensity Group	Control Group	SOV	Sum of Squares	df	Mean Square	Obtained f ratio
Pretest Mean S.D.	51.47	51.53	51.60	51.53	B	0.93	3	0.31	0.06
	1.77	1.85	2.53	2.54	W	271.47	56	4.85	
Post test Mean S.D.	63.53	61.73	59.47	52.27	B	1099.22	3	366.64	48.50*
	2.59	2.94	2.45	2.99	W	423.37	56	7.56	
Adjusted post test Mean	63.66	61.80	59.47	52.07	B	1158.38	3	386.19	124.60*
					W	170.47	55	3.10	

*Significant at 0.05 level of confidence

The adjusted post-test mean on leg explosive power (vertical jump) of high, medium and low intensity plyometric training and control I groups are 63.66, 61.80, 59.47 and 52.07 respectively. The obtained 'F'ratio of 124.60 for adjusted post-test score is greater than the table value of 2.78 for df. 3 and 55 required for

significance at 0.05 level of confidence on leg explosive power (vertical jump). The results of the study indicates that there was a significant difference among the adjusted post-test means of high, medium and low intensity plyometric training and control groups on leg explosive power – vertical jump.

Table II. Analysis of covariance of the data on the Leg Explosive power (horizontal) standing broad jump of pre-test and post-test scores of high intensity, medium intensity, low intensity and control groups

Test	High Intensity Group	Medium Intensity Group	Low Intensity Group	Control Group	SOV	Sum of Squares	df	Mean Square	Obtained F ratio
Pretest Mean S.D.	197.27	200.53	204.20	200.53	B	230.73	3	76.91	0.50
	13.82	10.78	10.18	14.28	W	8604.00	56	153.64	
Post test Mean S.D.	221.53	219.13	213.60	203.20	B	2990.47	3	996.82	5.96*
	14.47	11.73	10.47	14.58	W	9367.47	56	167.28	
Adjusted post test Mean	224.11	220.40	211.10	201.86	B	4395.62	3	146.21	319.16*
					W	252.50	55	4.59	

*Significant at 0.05 level of confidence

The table II shows that the pre-test mean values of leg explosive power (Horizontal) standing broad jump of high, medium and low intensity plyometric training and control groups are 197.27, 200.53, 204.20 and 200.53 centimeters respectively. The obtained “F” ratio of 0.50 for pre-test is less than the table value of 2.77 for df 3 and 56 required for significance at 0.05 level of confidence. The post –test mean values of leg explosive power (Horizontal) standing broad jump of high, medium and low intensity plyometric training and control I groups are 221.53, 219.13, 213.60 and 203.20 centimeters respectively. The obtained “F” ratio of 5.96 for post test scores is greater than the table value of 2.77 for df 3 and 56 required for significance at 0.05 level of confidence on leg explosive power (Horizontal) standing broad jump. The adjusted post-test mean on leg explosive power (Horizontal) standing broad jump of high, medium and low intensity plyometric training and control groups are 224.11, 220.40, 211.10 and 201.86 respectively. The obtained ‘F’ratio of 319.16 for adjusted post-test score is greater than the table value of 2.78 for df. 3 and 55 required for significance at 0.05 level of confidence on leg explosive power (Horizontal) standing broad jump. The results of the study indicates that there was a significant difference among the adjusted post-test means of high, medium and low intensity plyometric training and control groups on leg explosive power (Horizontal) standing broad jump.

Conclusion

In the light of the study under taken certain limitations imposed by the experimental conditions, the following conclusions were arrived at.

1. Varied intensities of plyometric training improved leg explosive power – vertical and horizontal (vertical jump and standing broad jump) abilities among college men players.
2. The experimental group I with 3 days training in week, having high intensity plyometric exercises for 12 weeks had improved significantly leg explosive power (vertical and horizontal) than the experimental groups with other intensity plyometric training and control group. Whereas high intensity plyometric training group and medium intensity plyometric training group had not significantly improved in leg explosive power – vertical only.
3. The experimental group II with 3 days training in week, having medium intensity plyometric training for 12 weeks had improved significantly leg explosive power (vertical and horizontal) than the low intensity plyometric training group and then control group.
4. The experimental group III with 3 days training in week, with low intensity plyometric training for 12 weeks had improved significantly leg explosive power (vertical and horizontal) than the control group.
5. Finally it concluded that the high intensity plyometric training 3 days in a week for 12 weeks is having

better influence on the selected dependent variables.

Recommendations

1. On the basis of findings of the study is recommended that gradual increase of load with high intensity plyometric training, the desired benefits may be achieved.
2. Varied intensities of plyometric training can be used according to the status of the players to develop jumping ability of the players, especially volley ball and basket ball games where jumping for spiking, blocking, jump service, lay up shot, dunking extra and also in jumping events like broad jump, high jump, triple jump and pole vault is needed.
3. In the present study groups which underwent high intensity of plyometric training, medium intensity of plyometric training and low intensity of plyometric training for 3 days in week had improved significantly. Hence it is recommended that depending up on the need, age, variables, game and status of the players the intensity can be fixed.
4. Plyometrics is the best training system adopted by many coaches and experts in physical education in modern coaching system for developing explosive power which is more essential in many of the skills in various sports. Hence it is recommended to utilize this training system at the age 14 years school level I for gradual adaptation and improvement of the student’s performance.
5. plyometric training can be given for developing elastic strength which is more essential for all explosive sports like sprinting, throws and jumps in athletics except middle and long distance runners (Aerobic endurance events).

Suggestions for Further Research

1. The same study may be conducted for college female volley ball players.
2. This study may be followed up by having a mid test at the end of 6th week, so that its influence can be assessed and compared with final test.
3. This study may be conducted for Basket ball game by using college men and women players separately.
4. Similar study may be conducted on by using sprinters/jumpers/ throwers.

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