



Influence of plyometric training on selected strength and explosive power

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Abstract

The purpose of the study was to find out the effect of eight weeks of plyometric training on selected strength and power parameters among university women physical education students. Fifteen women students studying in the Department of Physical Education and Sports Sciences, Annamalai University were selected as subjects at random subjects each with age ranging from 18 to 25 years (Mean age 21.6 ± 0.7 months). They were underwent plyometric training for three alternative days per week for eight weeks. In the present study plyometric training is considered as independent variable and the dependent variables namely leg strength and explosive power in terms of vertical distance were selected.

The data we recollected prior and immediately after the training programme on Leg strength and explosive power in terms of vertical distance. The leg strength was measured by leg lift dynamometer and explosive power in terms of vertical distance was measured by sargent jump respectively. The collected data of experimental group was statistically analyzed by using mean standard deviation and t-test and The level of significant was fixed at 0.01 level of confidence. It was concluded that the results of the study showed a significant difference exist between pre and post tests of plyometric training group on leg strength and explosive power in terms of vertical distance due to 8 weeks of plyometric training.

Keyword; plyometric training, leg strength, explosive power in terms of vertical distance.

Introduction

Training is a programme of exercise designed to improve the skills and increase the energy capacities of an athlete for a particular event. Plyometric is defined as exercise that enables a muscle to reach maximum strength in short time as possible. These types of training increase power, speed, strength and endurance. When a concentric contraction (a muscle shortens) occurs immediately followed by an eccentric contraction (muscle lengthens) then the force can be dramatically increased. It is the intense exercise that trains the muscle to produce power. Power is the combination of speed and strength. Both are the integral components of the fitness. It is derived from Greek word plyo means to increase and metric means to measure it means increase the measurement. The capacity of the lower limb is to exert muscle force. Leg strength measures the limb of lifting resistance in lowering and arising from sitting position. Explosive power is the ability of the muscle or a group of muscles to release maximum force in the shortest possible time, in an explosive manner, projecting the body or an object. It is the ability of the sportsman to overcome resistance with high speed.

Reviews

Senthilnathan et.al.,(2010) examined the study was focused on influence of plyometric training on arm strength and leg strength between all India inter university racquet game and bat game players. 25 racquet game players and 25 bat game players of age 18-22 years were selected from All India inter university tournament held in 2006-2007. The experimental group was made to go through 12 weeks (3 days/week) exercise programme based on plyometric training procedures. Data were collected and analysed by using ANCOVA and their group means were compared by DMRT. Results showed there was no significant relationship between arm and leg strength in mid test among both groups. Changes were indicated after the post test was taken. Significant increases in arm and leg strength were noticed in racquet game players than the bat game players at the end of 12 weeks training.

Based on the results of the study, it was concluded that 12 weeks plyometric training with repeated plyometric push ups and jumps enhances the muscle power and strengthens the arm and leg. Moreover the study also concluded that plyometric training is capable of improving arm and leg muscle strength and power significantly. The study showed better improvement in Racquet game players when compared to Bat game players at the end of training. Hence they gained better arm and leg strength whereas the other group showed no significant changes when compared to post test data.

Singh (2015) conducted the study was designed to find the 6 weeks of plyometric effect of vertical jump ability of state level volleyball players. Total 20 volleyball players of Amritsar district were selected. Vertical jump ability was dependent variable and plyometric training was independent variable. Two groups were made by dividing subjects randomly, Experimental group (n=10) and control group (n=10). Experimental group was given 6 weeks of plyometric training while control group participated only in their routine programme. For the data collection, Sargent jump test was used. Pre and post tests were taken.

To analyze the data, t –test used to test the effect of plyometric treatment at 0.05 significance level. The outcome of the study reveals that in experimental group, the difference was statistically significant but no significance found between means of control group. Conclusion; Identification of plyometric training programme as more beneficial and effective than general training programme and have more positive effect on vertical jump performance.

METHODOLOGY

The purpose of the study was to find out the effect of eight weeks of plyometric training on selected strength and power parameters among university women physical education students. Fifteen women students studying in the Department of Physical Education and Sports Sciences, Annamalai University were selected as subjects at random subjects each with age ranging from 18 to 25 years (Mean age 21.6 ± 0.7 months). They were underwent plyometric training for three alternative days per week for eight weeks. The experimental group was called weight training group (PTG) In every training session the workout lasted for 60 minutes including warming up and warm down exercise. The subjects underwent Plyometric training programme under strict supervision of the investigator. However individual differences were taken into account which fixing load. The over load principle was applied. Progressively workload was increased in two weeks once. In the present study plyometric training is considered as independent variable and the dependent variables namely leg strength and explosive power in terms of vertical distance were selected.

Plyometric training exercise consists of skipping, split style jump, step-ups, bounding, clapping push up, jumping squat, single leg hopping, bunny hop and hurdle jump. The data we recollected prior and immediately after the training programme on Leg strength and explosive power in terms of vertical distance. The leg strength was measured by leg lift dynamometer and explosive power in terms of vertical distance was measured by sargent jump respectively. The collected data of experimental group was statistically analyzed by using mean standard deviation and t-test and present table I and II. The level of significant was fixed at 0.01 level of confidence.

TABLE-I

The mean, standard deviation and t- value of experimental groups on leg strength

S.No	Leg strength	Mean	S.D	S.E	t- Value
1.	Pre test	90.87	1.30	0.41	5.20*
2	Post test	93.00	0.95		

* Significant at 0.01 level of confidence this table value for the significance of 2.58

Table –I reveals the mean, standard deviation, standard error and t- value of pre and post test scores of experimental group. The t- values of the leg strength was significantly improved and it showed the efficiency of weight training. In the value of selected leg strength was greater than the table value of 2.58 and it was found to be statically significant.

TABLE-II

The mean, standard deviation and t- value of experimental groups on explosive power in terms of vertical distance

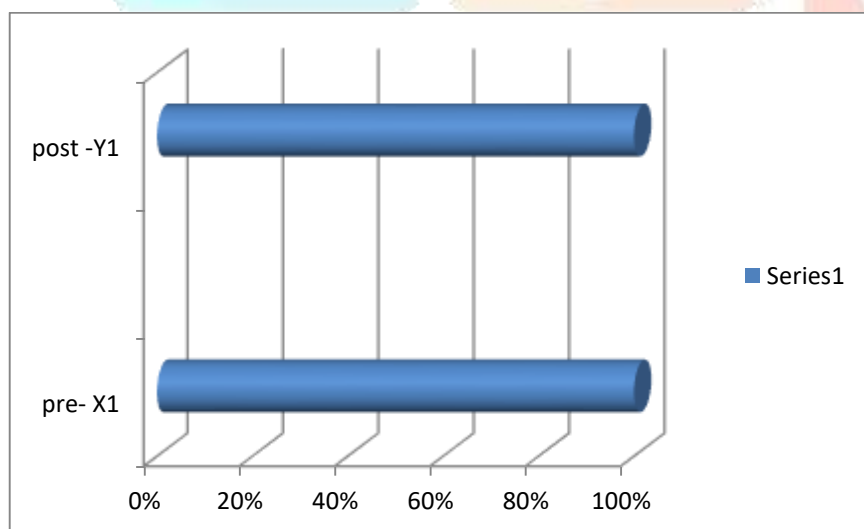
S. No	Explosive power	Mean	S.D	S.E	t- Value
1.	Pre test	46.67	0.90	0.39	5.46*
2	Post test	48.8	1.14		

* Significant at 0.01 level of confidence this table value for the significance of 2.58

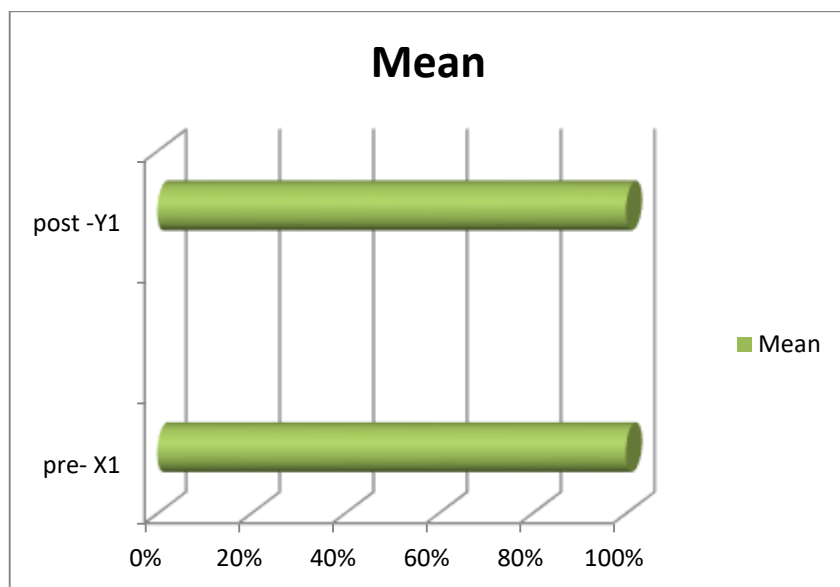
Table –I reveals the mean, standard deviation, standard error and t- value of pre and post test scores of experimental group. The t- values of the explosive power in terms of vertical distance was significantly altered and it showed the efficiency of weight training. In the value of selected explosive power in terms of vertical distance was greater than the table value of 2.58 and it was found to be statically significant.

Figure I

Comparisons of mean difference on leg strength

**Figure II**

Comparisons of mean difference on explosive power in terms of vertical distance



Conclusion

It was concluded that the results of the study showed a significant difference exist between pre and post tests plyometric training group on leg strength and explosive power in terms of vertical distance. Due to training musculo skeletal system tolerance increased, Greater extension of muscle fibre, and Stimulate various changes in neuro muscular system the ability to muscle group to respond more fastly and powerfully to light and fast changes in muscle lengths. Moreover it was concluded that there was a significant improvement on selected criterion variables such as leg strength and explosive power in terms of vertical distance due to eight weeks of plyometric training programme among physical education women.

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