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Effect of Plyometric Training on Strength Endurance of Male Hostel Students

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Abstract

The purpose of the present study was to find out the effect of plyometric training on strength endurance of young male hostel students. To achieve the purpose twenty (n = 20) young male students were selected as subjects and their age ranged between 18 and 25 years. They were divided into two equal groups, each group consisted of ten (n = 10) subjects. The group I underwent plyometric training (PTG), and group II acted as a control (CG) who did not exposed any special training apart from their regular activities. The training period for this study was limited to five days in a week for eight weeks. Abdominal strength endurance was selected as a criterion variable of this study and it was measured by using bent knee sit-ups. The analysis of covariance (ANCOVA) was applied as a statistical tool. In all cases 0.05 level of confidence was fixed to test the significance, which was considered as an appropriate. It was concluded from the result of the study that there was a significant improvement ($p \leq 0.05$) due to plyometric training on abdominal strength endurance as compared to control group.

***Key words**: Plyometric training, strength endurance, male hostel students*



1. Introduction

Plyometrics, also known as "jump training" or "plyos", are exercises in which muscles exert maximum force in short intervals of time, with the goal of increasing power speed and strength. This training focuses on learning to move from a muscle extension to a contraction in a rapid or "explosive" manner, such as in specialized repeated jumping (Donald, 1988). Plyometrics are primarily used by athletes, especially martial artists, sprinters and high jumpers, to improve performance, and are used in the fitness field to a much lesser degree. Plyometrics includes explosive powerful

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training exercises that are trained to activate the quick response and elastic properties of the major muscles in the body (Joe, 2013). It was initially made famous by Soviet Olympians in the 1970s, providing the core element in the strength programs of elite sporting athletes worldwide. Sports using plyometrics include basketball, tennis, badminton, squash and volleyball as well as the various codes of football (Yeses, 2009). The landing and takeoff are executed in an extremely short period of time, in the range of 0.1–0.2 second. The shock method is the most effective method used by athletes to improve their speed, quickness, and power after development of a strong strength base. By doing exercises such as the depth jump, that he created, the athlete would enhance his ability in the takeoff and his resultant performance in the running or jumping event (Fred & Michael, 2013). He experimented with many different exercises, but the depth jump appeared to be the best for duplicating the forces in the landing and takeoff.

Strength endurance is defined as the capacity of the whole organism to withstand fatigue under the long lasting expenditure of strength. Consequently, it is characterized by a relatively high ability to express strength together with faculty of the preserve. Strength endurance is the specific form of strength displayed on activities which require a relatively long duration of muscle tension with minimal decrease in efficiency. All forms of competition however necessitate maximal output over the duration of the event. It is not always the strongest athlete who wins in all cases, rather the one that can sustain the most power over full term activity. There forth development of all the various types of muscles fibers benefits the athlete (Clark & David, 1987). Predominantly the fast twitch muscle fibers create maximum power output in the explosive sports such as sprinting and weightlifting. Slow twitch fibers are the prime fiber cells used in long distance aerobics events. Combining and training, these two types of fibers at all speeds and angles produce strength endurance. There are muscle fibers that are not what you would call exclusively fast twitch or exclusive slow switch. But, strengthening these muscle fibers will enable a greater expression of strength to occur. In all sports movement, whether fast or slow, movements have to be done under lesser or high conditions of fatigue (Uppal & Alifereti, 1984). Even for sprints, some amount of strength endurance is required in the last phase or in heats (Singh, 1991). Strength endurance therefore, is important in most of the sports.

2. Materials and Methods

The present study effort was made to find out the effect of plyometric training on strength endurance of young male hostel students. For this purpose twenty (n = 20) young male students were selected as subjects and their age ranged between 20 and 25 years. They were divided into two equal groups, each group consisted of ten (n = 10) subjects. The group I underwent plyometric training (PTG), and group II acted as a control (CG) who did not exposed any special training apart from their regular activities. The training period of this study was limited to five days in a week for eight weeks. Abdominal strength endurance was selected as a criterion variable and it was measured by using bent knee sit ups. For every training programmer there would be a change in various structures and system in a human body. The experimentation was subjected to eight weeks of plyometric training. The following plyometric exercises were used to plyometric training and performed with progressive methods, side to side angle hops, standing jump and reach, standing jump over an obstacle, squat jump, pike jump split, clapping push-up, incline depth jump push-ups, elevated explosive push-ups. The training programme was scheduled for one session per day between 6 am to 7am. Training was given under the direct supervision of the investigator. The progression of load was followed during experimentation. The exercises were arranged from simple to complex.

3. Data Analysis

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Mean and Standard deviation were calculated for strength endurance for each training group. And the data analyzed by using analysis of covariance (ANCOVA). Statistical significance was fixed at 0.05 levels.

4. Result and Discussions

Table - I
Analysis of Covariance on Strength Endurance of Plyometric Training group and the Control Group

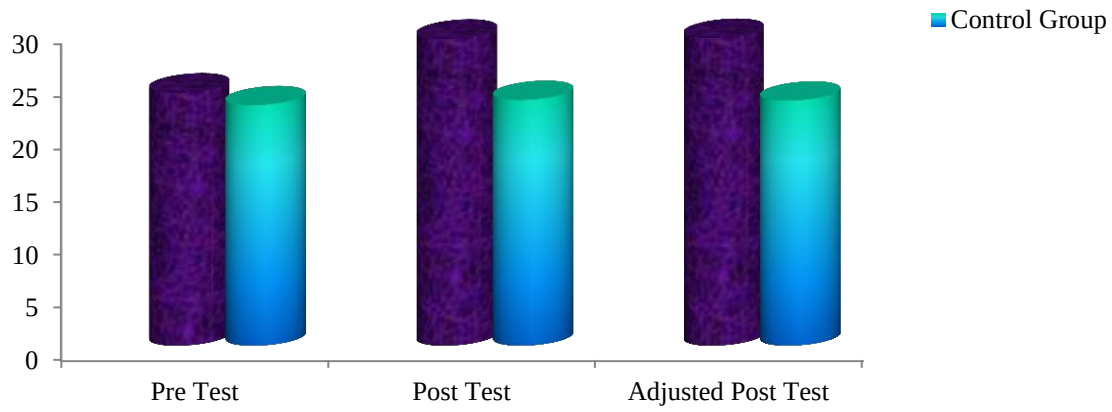
Test		PTG	CG	SOV	SS	df	MS	*F* ratio
Pretest	Mean	24.00	22.80	B	7.20	1	7.20	0.36
	SD	3.527	5.245	W	359.60	18	19.978	
Post test	Mean	29.10	23.30	B	168.2	1	168.20	17.50*
	SD	4.067	1.636	W	173.00	18	9.611	
Adjusted Post test	Mean	29.17	23.23	B W	173.43 167.52	1 17	173.41 9.854	17.60*

*Significant at 0.05 level of confidence
(The table value required for significance at 0.05 level of confidence with df 1 and 18 and 1 and 17 are 4.41 and 4.45 respectively)

Table I shows that the pre test means of plyometric raining group and the control group are 24.00 and 22.800 respectively. The obtained *F* ratio of 0.36 for the pre test mean is less than the table value 4.41 for df 1 and 18 required for significance at 0.05 level. The post tests mean of plyometric training and control groups are 29.100 and 23.300 respectively. The obtained F ratio of 17.50 for post test mean is higher than the table value 4.41 for df 1 and 18 required for significance at 0.05 level. The adjusted post test mean of plyometric training group and the control group are 29.17 and 23.23 respectively. The obtained *F* ratio of 17.60 for adjusted post test mean is higher than the required table value 4.45 for df 1 and 17 required for significant at 0.05 level.
The result of the study indicated that there was a significant difference between the adjusted post test mean of the plyometric training and the control group on strength endurance at 0.05 levels. The pre, post and adjusted post test mean values of the plyometric training and the control group on strength endurance is graphically represented in the figure l.

Figure 1
The Pre, Post and Adjusted Post Test Mean Values of Experimental Group and Control group on Abdominal Strength Endurance

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5. Conclusion

The plyometric training can be improved abdominal strength endurance during the age between 20 and 25 years of young male hostel students. The results of the study indicated that there was a significant improvement on strength endurance due to eight weeks of plyometric training. From the results we recommended that the plyometric training is very suitable to improve abdominal strength endurance.

6. Discussion

The present study aimed to effect of plyometric training on strength endurance among young male hostel students. (Dorgo, 2000) conducted his study to evaluate the effect of plyometric training programme of muscular strength and endurance of 93 boys at Kendriya Vidyalaya. The result of the study indicated that the plyometric training method is proceeded better result in muscular strength and endurance compared to control group. (Karthikayan, 1988) conducted his study to effect varied load plyometric training on selected strength parameters of 45 men students. The result of the study indicated that there was a significant improvement on leg strength and strength endurance when compared to control group. (Sukumarbiju, 2008) had conducted his study to effect of plyometric exercises on strength endurance of deaf high school students. The results revealed that plyometric exercises group produced significant improvement for deaf students on their strength endurance as compared to control group. Ali, 2001) had conducted his study to evaluate the effect of using plyometric training of improving strength endurance, aerobic endurance of 21 long distance male runners. The study recommended that training programme improved the strength endurance, aerobic endurance.

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About the Author



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