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Impact of Different Modes of Jump Training On Maximum Leg Strength of Boys

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Abstract

The purpose of the study was to determine the impact of different modes of jump training on maximum leg strength of boys. To achieve the purpose of the study thirty boys from university of Kashmir were selected as subjects. They were randomly divided into three groups of 10 participants each. All these groups served as experimental groups that participated in depth jumping, rebound jumping and horizontal jumping exercises. The variable measured in this study was maximum strength of the legs. The variable was measured using the leg lift with dynamometer. The training programme for this study lasted for a period of 12 weeks, 3 hours a day with suitable warming up and cooling down activities. The result of the study also shows that the depth jumping and horizontal jump training protocol increased maximum strength of legs significantly when compared with rebound jump training.

Key Words: Jump training, Leg strength, Depth jumping

Introduction

Muscle strength plays a cardinal role in achieving athletic excellence. The common denominator in sports in how the muscles can perform in activities (Guyton, 1991). Muscles of the lower extremities play a vital role in the successful execution of skills in many games and sports. Apart from soccer, combat sports and running & jumping events in athletics, direct use of the quadriceps is not common to other sports. Most of those sports which depend mainly on the arms and other parts of the body require strength and endurance of the quadriceps as well. This strength and endurance of the quadriceps muscle is used to generate force and carry them through the stress and duration of their activity.

Muscular strength is the maximal force or torque a muscle or muscle group can generate at a specified velocity (Komi, 1992; Hockey, 1993). Muscle strength is considered to be a basic component in the performance of physical skills and in almost all competitive activities the performer with the greater amount of strength has the advantage.

Strength becomes a priority in sports where heavy weights such as the body must be lifted & carried (Sharkey, 1986). Jumping exercises have been used successfully over the years to elicit training responses from athletes. Explosive training is almost exclusively applied to extensor muscle of the quadriceps, and consists of a vigorous lengthening of the active extensor muscles

immediately followed by a maximal concentric contraction. They are most frequently used as a means of increasing speed and anaerobic power output in sprinting and jumping, but the techniques may also be of value to other types of sportsmen (Watson, 1993; Wausen, 1990). Some studies described jump exercises as explosive calisthenic-like exercises which involves the condition of the neuromuscular system to permit faster and more powerful changes of direction, such as moving up and down in jumping or switching quadriceps positions as in running (Sharkey, 1986). This study focused on the impact of depth jumping, rebound jumping and horizontal jumping on the lower extremity maximum strength development of boys.

Methodology

To achieve the purpose of the study thirty boys from university of Kashmir were selected as subjects. They were randomly divided into three groups of 10 participants each. All these groups served as experimental groups that participated in depth jumping, rebound jumping and horizontal jumping exercises. The variable measured in this study was maximum strength of the legs. The variable was measured using the leg lift with dynamometer. The training programme for this study lasted for a period of 12 weeks, 3 hours a day with suitable warming up and cooling down activities. The data on pre and post test of maximum strength of legs was analysed by using Analysis of covariance (ANCOVA). The results were subjected to further analysis using the Scheffe's test to locate whether significant differences existed among the groups. All variables were tested at 0.05 level of significance.

Result

Table-1

Analysis of covariance on maximum strength among different jumping groups

Test		**Depth Jump Group**	**Horizontal Jump group**	**Rebound Jump Group**	**SOV**	**SS**	**Df**	**Ms**	**'F' Ratio**
Pre test	**Mean**	66.30	65.10	65.60	B	3.27	2	1.63	**0.585**
	SD	1.56	1.91	1.50	W	75.40	27	2.79	
Post test	**Mean**	77.30	76.30	74.20	B	40.86	2	20.43	**9.03***
	SD	2.02	1.49	0.63	W	60.98	27	2.25	
Adjusted Post Test	**Mean**	77.70	76.35	74.19	B	36.92	2	18.46	**7.78***
					w	61.51	26	2.37	

***Significant at .05 level of confidence**

The table value required for significance at .05 level of confidence with df 2 and 27, 2 and 26 was 3.35, 3.37 respectively. Table 1 show that there was a significant difference among depth jump group, rebound jump group and horizontal jump group on maximum strength of the legs.

Table-II

Scheffe's Post Hoc Test on Maximum Strength among Different Jumping Groups

Depth Jump Group	Horizontal jump group	Rebound jump group	Mean Difference	Confidence Interval Value
77.70	76.35		1.35*	0.40
77.70	-	74.19	3.51*	0.40
-	76.35	74.19	2.16*	0.40

***Significant at .05 level of confidence.**

Table II shows that there was a significant difference between depth jump group and rebound jump group, depth jump group and horizontal jump group, rebound jump group and horizontal jump group on maximum strength of the legs.

Discussions

Results of the present study are in consonance with some of the previous studies. Some studies reported that plyometric training, weight training and complex training could improve the strength (Adams et, al., 1992). The reasons of increase in strength by weight training and complex training can be the type of plyometric and weight training exercises used and or the training stimulus. Saez Saez de Villarreal et al. (2008) reported that 7 weeks plyometric training with different frequency in male students showed a significant increase in strength .

The result of this study revealed that out of the three jump training programmes, depth jumping and the rebound jumping training significantly improved maximum leg strength of participants. This result correlates with the findings of Brown, Mayhew and Boleach (1986) who reported a 43 percent increase in hamstring strength gains following a 12 week period of depth jumping and quadriceps bounding plyometric training carried out on a group of male students. (Reilly, 1992) also found that depth jumping drills are capable of improving power and explosive strength, and concluded that plyometric drills could be included in a strength training programme because it emphasizes elastic properties of muscle in their execution and tend to develop muscle strength. Klausen (1990) reported a modest increase in isometric and concentric maximal strength of participants following plyometric training with depth jumping characteristics. The depth jumping group probably performed better than the other training groups because of the nature of the exercise and the advantage it has in storing sufficient

potential energy during the eccentric phase of the movement and converting it to kinetic energy during the concentric phase of movement which leads to rapid explosive movement (Brzycki, 1986).

Conclusion

The result of the study also shows that the depth jumping and horizontal jump training protocol increased maximum strength of legs significantly when compared with rebound jump training. So it is suggested that all the modes of jump training are beneficial for the development of maximum leg strength and depth and horizontal jump protocols are better than rebound jump training.

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