



Effects of Plyometric Training, Skill Training and Combined Training on Selected Bio-Chemical Variables of Men Hockey Players

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ABSTRACT

The present study was designed to find out the effects of Plyometric training, Skill training and Combined training of selected Bio-Chemical Variables of Men Hockey players. To attain the purpose, sixty men Hockey Players who have participated in Thiruvalluvar University Vellore inter collegiate tournaments during the year 2014-2015 were randomly selected as subjects. The subjects were assigned at random into four groups of fifteen each (n=15). Group-I underwent Plyometric training, Group-II underwent Skill training, Group-III underwent Combined Plyometric and Skill Training and Group-IV acted as Control. The duration of the training period for all the three Experimental groups was restricted to twelve weeks and the number of sessions per week was confined to three in a week. For Combined Plyometric and Skill Training the training period was restricted to alternative weeks for twelve weeks. The dependent variable selected for this study was Total Cholesterol (TC). Total Cholesterol (TC) was assessed by Calorimetric method. All the subjects were tested prior to and immediately after the training for all the selected variables. Data were collected and statistically analyzed using ANCOVA. Scheffe's post hoc test was applied to determine the significant difference between the paired means. In all the cases 0.05 level of significance was fixed. The results of the study showed that there was a significant difference was found among all the Experimental groups namely Plyometric Training, Skill Training and Combined Plyometric and Skill Training groups had significantly increase in the Total Cholesterol (TC). Further the results of the study showed that Combined Plyometric and Skill Training group was found to be better than the Plyometric Training group and Skill Training group in Total Cholesterol (TC).

KEYWORDS : Plyometric Training, Skill Training, Combined Training, Total Cholesterol (TC)

INTRODUCTION

The term Plyometrics refers to a training method based on the belief that pre-stretching a muscle prior to a concentric contraction will result in a more powerful concentric contraction.

Plyometrics refers to bodily movement that involves an eccentric (lengthening) muscle contraction immediately and rapidly followed by a concentric (shortening) contraction. This is often referred to as the stretch-shortening cycle. The phase between these two contractions is referred to as the amortization phase. Energy stored during the eccentric phase is partially recovered during the concentric phase. In order to make best use of this stored energy the eccentric phase must be rapidly followed by the concentric contraction.

Power output and reactive neuromuscular control represents a component of function. Power and reactive neuromuscular control are perhaps the best measures of success in activities that require rapid force production. Plyometric training, also called reactive training, makes use of the stretch shortening cycle to produce maximum force in the shortest period of time and to enhance neuromuscular control, efficient rate of force production, and reduce neuromuscular inhibition (Chimera et al., 2004).

A Skill is the learnt capacity or talent to carry out pre-determined results often with the minimum outplay of time energy or both.

Exploring one's own capabilities games e coverage the player to look at, understand, and experience things.

A movement dependent on practice and experience for its execution, as opposed to being genetically defined. It is a learned movement and is an essential component of sport. Skill enables athletes to produce predetermine results with maximum certainty, often with the minimum expenditure of energy. Three important components of skill are effectiveness, consistency (the ability to reproduce the skill), and efficiency.

Field Hockey is considered to be an endurance event. Various skill in Field Hockey demands display of specific strength and endurance. A definite degree of strength of arm muscle is required to do the basic skills like hitting, pushing, and scooping. Hockey requires a higher degree of running ability. The extension of the Hockey field is large, so

that the players are able to run the whole field without fatigue and compete with their opponents. So that the quality of muscular endurance and cardio respiratory endurance is highly required for a Hockey player to improve his performance. There are trainings like circuit and weight training to develop and improve strength and interval and resistance training to improve the speed. Circuit training has proved to be a very effective method for improving strength endurance (Seaton et al., 1983).

METHODOLOGY

The study was conducted on sixty men Hockey Players who have participated in Thiruvalluvar University Vellore inter collegiate tournaments during the year 2014-2015 were randomly selected as subjects. Subjects were randomly assigned equally into four groups. Group-I underwent Plyometric training, Group-II underwent Skill training, Group-III underwent Combined Plyometric and Skill Training and Group-IV acted as Control. The experimental groups underwent the respective training for a period of 12 weeks (3 days/week), the Combined Plyometric and Skill Training the training period was restricted to alternative weeks for twelve weeks whereas the control remain as normal with the sedentary life.

Among the various Bio-Chemical fitness parameters only Total Cholesterol (TC) was selected as dependent variable. Total Cholesterol (TC) was assessed by Calorimetric method (Natarajan, 2014). All the four groups were tested on selected Total Cholesterol (TC) was analyzed before and after the training period.

ANALYSIS OF THE DATA

The data collected from the experimental groups and control group on prior and after experimentation on selected variables were statistically examined by analysis of covariance (ANCOVA) was used to determine differences, if any among the adjusted post test means on selected criterion variables separately. Whenever they obtained f-ratio value in the simple effect was significant the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. In all the cases 0.05 level of significance was fixed.

The Analysis of covariance (ANCOVA) on Total Cholesterol (TC) of Experimental Groups and Control group have been analyzed and presented in Table -1.

Table – 1
Values of Analysis of Covariance for Experimental Groups and Control Group on Total Cholesterol (TC)

Certain Variables	Adjusted Post test Means				Source of Variance	Sum of Squares	df	Mean Squares	'F' Ratio
	Plyometric Training Group	Skill Training Group	Combined Plyometric and Skill Training Group	Control Group					
Total Cholesterol (TC)	182.05	179.67	176.53	189.61	Between	1396.98	3	465.66	43.53*
					With in	588.39	55	10.70	

*** Significant at.05 level of confidence**
(The table value required for Significance at 0.05 level with df 3 and 55 is 2.77)

Table-1 shows that the adjusted post test mean value of Total Cholesterol (TC) for Plyometric Training group, Skill Training group, Combined Plyometric and Skill Training group and Control group is 182.05, 179.67, 176.53 and 189.61 respectively. The obtained F-ratio of 43.53 for the adjusted post test mean is more than the table value of 2.77 for df 3 and 55 required for significance at 0.05 level of confidence.

The results of the study indicate that there are significant differences among the adjusted post test means of Experimental groups on the decrease of Total Cholesterol (TC).

To determine which of the paired means had a significant difference, Scheffe's test was applied as Post hoc test and the results are presented in Table-2.

Table - 2
The Scheffe's test for the differences between the adjusted post tests paired means on Total Cholesterol (TC)

Certain Variables	Adjusted Post test Means				Mean Difference	Confidence Interval
	Plyometric Training Group	Skill Training Group	Combined Plyometric and Skill Training Group	Control Group		
Total Cholesterol (TC)	182.05	179.67	--	--	2.38*	2.04
	182.05	--	176.53	--	5.52*	2.04
	182.05	--	--	189.61	7.56*	2.04
	--	179.67	176.53	--	3.14*	2.04
	--	179.67	--	189.61	9.94*	2.04
	--	--	176.53	189.61	13.08*	2.04

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

Table-2 shows that the adjusted post test mean differences on Total Cholesterol (TC) between Plyometric group and Skill training group, Plyometric training group and Combined Plyometric and Skill training group, Plyometric training group and Control group, Skill training group and Combined Plyometric and Skill training group, Skill Training group and Control group, Combined Plyometric and Skill training group and Control group are 2.38, 5.52, 7.56, 3.14, 9.94 and 13.08 respectively and they are greater than the confidence interval value 2.04, which shows significant differences at 0.05 level of confidence.

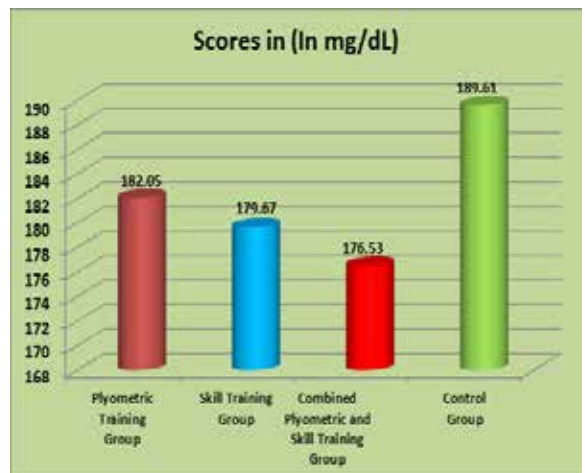
The results of the study further have revealed that there is a significant difference in Total Cholesterol (TC) between the adjusted post test means of Plyometric group and Skill training group, Plyometric training group and Combined Plyometric and Skill training group, Plyometric training group and Control group, Skill training group and Combined Plyometric and Skill training group, Skill Training group and Control group, Combined Plyometric and Skill training group and Control group.

However, the decrease in Total Cholesterol (TC) was significantly higher for Combined Plyometric and Skill training group than other Experimental groups.

It may be concluded that the Combined Plyometric and Skill training group has exhibited better than the other experimental groups in decreasing Total Cholesterol (TC).

The adjusted post test mean value of experimental groups on Total Cholesterol (TC) is graphically represented in the Figure -1.

Figure-1
Bar diagram on ordered adjusted means of Total Cholesterol (TC)



CONCLUSION

From the analysis of the data, the following conclusions were drawn.

1. Significant differences in achievement were found between Plyometric Training group, Skill Training group, Combined Plyometric and Skill Training group and Control group in the selected criterion variable such as Total Cholesterol (TC).
2. The Experimental groups namely, Plyometric Training group, Skill Training group and Combined Plyometric and Skill Training group had significantly improved in Bio-Chemical variable such as Total Cholesterol (TC).
3. The Combined Plyometric and Skill Training group was found to be better than the Plyometric Training group, Skill Training group and Control group in decreasing Total Cholesterol (TC).

REFERENCES

1. Chimera NJ, Swanik KA, Swanik CB (2004), Effects of Plyometric Training on Muscle-Activation Strategies and Performance in Female Athletes, *Journal of Athletic Training*;39:24–31.
2. Natarajan K. (2014), Effect of Slow and Brisk Walking on Selected Coronary Heart Disease Risk Factors and Physiological Parameters of Middle Aged Men, *Unpublished Ph.D Thesis*, Annamalai University, Annamalinagar.
3. Seaton Don Cash(1983), *Physical Education Hand Book*, Englewood Cliffs: Prentice Hall International.