EFFECT OF 8 WEEKS PLYOMETRIC TRAINING ON SPEED OF HOCKEY PLAYERS

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ABSTRACT

The plyometric training is a very important factor for hockey players for the improvement of maximal speed and it should be included in any conditioning program. The purpose of the present study was to find out the effect of plyometric exercises on speed in Hockey players of L.N.I.P.E, Gwalior. For the purpose of study 40 male hockey players were selected from L.N.I.P.E, Gwalior. The experimental and the control group were consisting of 20 players in each group. Training for eight weeks was given to the experimental group which consists of plyometric exercises on alternate days i.e. three sessions per week and controlled group were given general training. Fifty Meter Run was used for Pre Test and Post Test for both the experimental and controlled group to find out the effect of plyometric exercises for development of Speed. Results of This study shows that due to the plyometric exercise the experimental group has shown vast improvement compare to the controlled group in Pre Test and Post Test results. It was concluded that plyometric training significantly improves the speed of Hockey players.

Key Words: Plyometric exercises, Hockey and Speed.

INTRODUCTION:

Plyometrics also known as jump training is a training technique designed to increase muscular power and explosiveness. Originally developed for Olympic athletes, plyometric training has become a popular workout routine for people of all ages, including children and adolescents. Plyometric training enhance tissues abilities and train nerve cells to stimulate a specific pattern of muscle contraction so the muscle generates as strong a contraction as possible in the shortest amount of time (Blattner et. al., 1979). A plyometric contraction involves a rapid muscle lengthening movement (eccentric phase) first, followed by a short resting phase (amortization phase), then an explosive muscle shortening movement (concentric phase), which enables muscles to work together in doing the particular motion (Such L. V., 2012). Strength alone is a good indicative of speed. Although muscle strength is correlated to sprint performance, research has shown that combining both resistance training and plyometric training will have better effects on training. While plyometric assists in rapid force development (power), weight training

assists in maximal force output (strength) (Fatouros et. al., 2000). The purpose of plyometric is to emphasize speed-based power. One activity that requires speed-favoured power is high jumping: ultimately, jump height is determined by how fast one is moving once one's legs have left the ground (Gollnick et. al., 1981). Good jumpers may not have exceptional leg strength, but they can produce it at exceptional speeds. Studies have shown that training a plyometric activity such as drop jump allows the athlete to increase the pre-activation and pre-stretch of the muscles and allows the coach to assess landing techniques that are vital to the production of force With the increase of force production, an athlete becomes more powerful explosive and stable when performing tasks decreasing risk of injury and increasing overall performance on the playing field (Hedrick et al 1996)..

Using plyometric exercises for hockey is one the most effective ways to increase explosive speed and power. Speed is a key component of Physical fitness which is very important for Hockey Players for giving the high level of performance in competition. Speed is the performance pre requisite to do motor actions under given conditions in minimum of time. Speed is the quickness of movement of a limb, whether this is the legs of a runner or the arm of the shot putter. Speed is an integral part of every sport and can be expressed as any one of, or combination of, the following: maximum speed, elastic strength and speed endurance.

METHODOLOGY:

Selection of Subjects- Forty male hockey players age ranging from 19 to 24 years were selected from L.N.I.P.E, Gwalior as the sample for the study. The minimum training age of the players was minimum three years. The experimental and the control group were consisting of 20 players in each group.

Selection of Variables- For the purpose of the study speed was selected as the dependent variable and the training as independent variable.

Criterion Measured- Eight weeks of training was given to the experimental group which consists of Plyometric exercises on alternate days i.e. three sessions per week and controlled group were given general training. Plyometric exercises such hopping, bounding, depth jumps etc. were used in the training for the experimental group. Fifty meters Run were used for Pre Test and Post Test

for both the experimental and controlled group to find out the effect of Plyometric exercises for development of speed.

50 Meters Run Test for Speed:

Purpose: The aim of this test was to determine speed.

Equipment required: Measuring tape, marked track, Stop Watch, Cone markers etc. Procedure: The test involves running a single maximum sprint over 50 meters, with the time recorded. A thorough warm up was given, including some practice starts and accelerations.

Speed of the subjects was calculated by dividing the distance covered (in meters) by time taken (in seconds) by them.

Statistical Analysis- The data on speed was analysed by using Analysis of Covariance, where the pre performance of the groups was taken as a covariate.

RESULTS:

The descriptive statistics of the post data of groups on speed has been presented in the table presented below.

Table 1

DESCRIPTIVE STATISTICS OF THE POST DATA OF SELECTED GROUPS ON SPEED

Dependent Variable: Speed

Treatment_Group	Mean	Std. Deviation	N
Control	6.34	.21	20
Experimental	6.97	.21	20
Total	6.66	.38	40

Table 1 show that the means of the speed of control group and experimental groups are 6.34±0.21 and 6.97±0.21 respectively. It is clear from above table that the post data on speed is higher in case of experimental group.

Levene's test has been employed for the comparison of the variances of both the groups. Homogeneity of variance is an important assumption in case we want to apply one way analysis of covariance. The table of Levene's test has been presented in the table below.

Table 2

LEVENE'S TEST OF EQUALITY OF ERROR VARIANCES[a]

Dependent Variable: Speed

F	df1	df2	Sig.
16.926	1	38	.000

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Pre + Treatment_Group

Table 2 shows that the F value in case of Levene's test has been found significant, which shows that the variances of data collected from both the groups were not equal. Since, it is an important assumption for applying one way analysis of covariance; we may say that its significance may inflate the type one error.

One way analysis of covariance has been employed to see the differences in the speed of control group and experimental group and the table for the same has been presented in the table below.

Table 3

TEST OF BETWEEN SUBJECTS EFFECTS ON SPEED BETWEEN CONTROL AND EXPERIMANTAL GROUPS

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Pre Data	1.167	1	1.167	70.266	.000
Post Data	2.238	1	2.238	134.833	.000

Error	.614	37	.017
Total	1780.905	40	
Corrected Total	5.733	39	

Table 3 shows that the F value in case of pre data is significant as its corresponding sig. value is less than 0.05; which indicates that the means of the pre data on speed taken from both the groups was different. Table 3 also shows that the F-value in case of post data is also significant as its sig. value is less than 0.05. These results of the study show that the speed of both the groups after giving a training of 8 weeks were different.

The estimates of the means of the data on speed has been presented in the below table.

Table 4

ESTIMATES OF THE MEANS OF THE DATA ON SPEED

Dependent Variable:Speed

Treatment_Group	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
control	6.410[a]	.030	6.350	6.470
experimental	6.914[a]	.030	6.853	6.974

a. Covariates appearing in the model are evaluated at the following values: Pre = 6.3833.

It is evident from the table 4 that the means of both the group differs as far as the post data on speed is concerned.

DISCUSSION AND CONCLUSION:

By looking at the results of the study, it can be easily concluded that the eight weeks training programme can be useful for the development of the speed of the hockey players. Blattner et. al. (1979) has found a significant difference in vertical jump performance by the six weeks plyometric training. Edwin et. al. (2000) also has conducted a study on the effect of Plyometric

Intervention Program on the sprint performance and found positive results. So, by these studies and the results of our study we can conclude that the plyometric training programme can be useful in developing the speed of the players.

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