

IMPACT OF PLYOMETRIC TRAINING AND AEROBIC TRAINING ON FLEXIBILITY AMONG BASKETBALL PLAYERS

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ABSTRACT

The aim of study was to analyse the effect of twelve weeks plyometric training and aerobic training on flexibility among Basketball players. Forty five boys were selected as subjects who were attended Basketball coaching camp conducted by the Government Higher Secondary School, Chidambaram. The selected subjects were aged between 16 to 19 years. The selected subjects were randomly divided into three groups namely Group I, Group II and Group III of 15 subjects each. Group I underwent plyometric training and Group II underwent aerobic training for twelve weeks. Group III acted as control group and did not involve in any specific training. The subjects were tested agility before and after the training by sit and reach test. The analysis of covariance (ANCOVA) was used to find out the significant difference if any, among the experimental groups and control group on selected criterion variable. In all the cases, .05 level of confidence was fixed to test the significance, which was considered as appropriate. Since there were three groups involved in this study, the Scheffe's test was used as post-hoc test to determine the paired mean differences. As a result of plyometric and aerobic the flexibility of the subject is significantly improved. It is also concluded that aerobic exercises were significantly better than plyometrics.

Key words : *Plyometric Training, Aerobic Training, Flexibility*

INTRODUCTION

The game of basketball is the American's greatest contribution to the world of sports. The tempo and excitement is more in the play for both players and spectators. It is the only major sports that are entirely American in origin. Basketball was invented in 1891 at Springfield College by the late Dr. James Naismith. The inventor realized at that time that the game would develop is present portion in the field of national sports. It was his intention to introduce a game that could be played in door with a minimum amount of equipments.(Hobson,1949) The sports depending upon the aim to be achieved can be classified into various areas; school sports, rehabilitation sports, recreation and fitness sports,

industry sports and, performance sports. Each area of sports caters to different section of the society and has differed aims. The sports area, which has gained immense importance in recent times, and has made sports more popular and has contributed much towards the development of organized sports science in the performance sports. The major objective in training is to cause biological adaptation in any to improve performance in a specific task, to enhance physiological improvement effectively and to bring about a change. Specific exercise and overload must be followed, by exercising at a level above normal a variety of training adaptation take place in the body that makes it to function more efficiently. Basketball is a which demands a high level of physical fitness players need adequate strength, speed, agility, endurance, flexibility, explosive power reaction time to participate without under strain or fatigue while fast break one should maintain his balance without falling for with he should bring his centre of gravity between two legs of throw extend the as backward. Plyometrics include trouncing, jumping and a depth jumping exercises. The principle applies to any activity where the body is falling and the kinetic energy developed by the loaded muscle is utilized. Plyometric - concentric contractions while involving strength reflex, found in depth jumping and other bounding activities.(Hense,P. 1986). Aerobic training is any training that is performed that utilizes aerobic energy. Training primarily in an aerobic zone most efficiently improves aerobic capacity, trains the body to utilize fat for energy, reduces injury, improves recovery, and better prepares you for endurance activities (www.endurancedoc.com). Exercises that improve your flexibility feature moves that stretch your muscles, tendons, and ligaments. Activities such as Tai Chi can help improve your flexibility.

METHODOLOGY

Selection of subjects

Forty five boys were selected as subjects who were attended Basketball coaching camp conducted by the Government Higher Secondary School, Chidambaram. The selected subjects were aged between 16 to 19 years. The selected subjects were randomly divided into three

groups namely Group I, Group II and Group III of 15 subjects each.

Selection of variable

The plyometric training and aerobic training was selected as independent variables and the flexibility was selected as dependent variable. The subjects were tested before and after the training by sit and reach test.

Training programme

Group I underwent plyometric training and Group II underwent aerobic training for twelve weeks. Group III acted as control group and did not involve in any specific training. Plyometric exercises include rim jumps, depth jumps, cone hops with change of direction sprints, lateral cone hops, cone hops with 180 degree turn, depth jump with 180 degree turn, low post drill, catch and pass with jump-and-reach. The aerobic training programme used in the present investigation for the experimental groups were marching on the spot,

touch out, side to side, double side to side, grapevine, cross over step, knee curl, front kick, knee and arm lift. The subjects underwent twelve weeks training for six days per week in dawn from 6 to 7 am and dusk from 5 to 6 pm.

Statistical procedure

The analysis of covariance (ANCOVA) was used to find out the significant difference if any, among the experimental groups and control group on selected criterion variable. In all the cases, .05 level of confidence was fixed to test the significance, which was considered as appropriate. Since there were three groups involved in this study, the Scheffe's test was used as post-hoc test to determine the paired mean differences.

Analysis of data

The data collected pre-test and post-test of plyometric training, aerobic training and control groups of basketball players on flexibility were analysed and presented in Table - I.

Table – I Analysis of Covariance on Flexibility of Plyometric Training Aerobic Training and Control Group

	Plyometric Training Group	Aerobic Training Group	Control Group	S o V	Sum of squares	df	Mean square	F- ratio
Pre Test Mean	12.00	11.38	11.30	B	7.61	2	3.81	0.65
Standard Deviation	2.41	1.36	0.94	W	247.68	42	5.90	
Post Test Mean	13.25	13.23	11.50	B	60.67	2	30.34	4.98*
Standard Deviation	2.40	1.44	0.99	W	255.74	42	6.09	
Adjusted post test mean	12.85	13.43	11.70	B	46.60	2	23.30	49.57*
				W	19.16	41	0.47	

* Significant at .05 level of confidence.

Table – I showed that the pre-test values on flexibility for plyometric training, aerobic training and control groups were 12.00 ± 2.41 , 11.38 ± 1.36 and 11.30 ± 0.94 respectively. The obtained 'F' ratio value of 0.65 for pre-test score of plyometric training, aerobic training and control groups on flexibility was less than the required table value of 3.10 for significance with df 2 and 87 at .05 level of confidence, which indicates that there was no significant variation on flexibility among the three groups before the commencement of training.

The post-test mean values of flexibility for plyometric training, aerobic training and control groups were 13.25 ± 2.40 , 13.23 ± 1.44 , and 11.50 ± 0.99 respectively. The obtained 'F' ratio value of 4.98 for post-test scores of plyometric training, aerobic training and control

groups was more than the required table value of 3.10 for significance with df 2 and 87 at .05 level of confidence. It indicates that there is a significant variation in flexibility among the three groups after respective training for a period of 12 weeks.

The adjusted post-test mean values of flexibility for plyometric training, aerobic training and control groups were 12.85, 13.43 and 11.70 respectively. The obtained 'F' ratio value of 49.57 for adjusted post-test scores of plyometric training, aerobic training and control groups were more than the required table value of 3.10 for significance with df 2 and 86 at .05 level of confidence. The result of this study showed that there was a significant difference between plyometric training, aerobic training and control groups on flexibility.

Further to determine which of the paired means had a significant difference Scheffé *S* test was applied and the result was presented in Table – II.

Table – II: Scheffé *S* Test for The Difference between the Adjusted Post-Test Mean of Flexibility

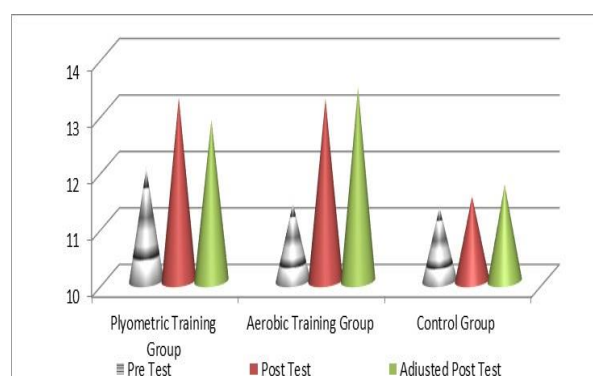
Plyometric training Group	Aerobic Training Group	Control Group	Mean Difference	Confidence Interval at .05 level
12.85		11.70	1.15*	0.30
12.85	13.43		0.58*	0.30
	13.43	11.70	1.73*	0.30

* Significant at .05 level of confidence.

Table – II shows that the mean difference in flexibility between plyometric training and control group is 1.15 and it is higher than the confidence interval required for significance at .05 level. This indicates that there is significant improvement in flexibility for plyometric training group as a result of 12 weeks training. The mean difference in flexibility between aerobic training and control group is 1.73 and it is higher than the confidence interval required for significance at .05 level. This indicates that there is significant improvement in flexibility for aerobic training group as a result of 12 weeks training. The mean difference in flexibility between plyometric training and aerobic training group is 0.58 and it is higher than the confidence interval required for significance at .05 level. This indicates that there is significant differences existed between plyometric and aerobic training.

The mean values of plyometric training, aerobic training groups and control group are presented in figure – I.

Fig- I - Mean Values of Plyometric Training, Aerobic Training and Control Groups on Flexibility



DISCUSSION

The following studies are supporting the result of the present study. Johnson, Salzberg and Stevenson (2011) evaluate the efficacy and safety of plyometric training for improving motor performance in young children. The research suggests that plyometric training is safe for children and improve the motor performance of the subjects. Noyes, FR, Barber-Westin, SD, Smith, ST, Campbell, T, and Garrison, TT.(2012) examined the effects of training program on neuromuscular and performance variables among female basketballers. This study shows that the training program significantly improved lower limb alignment on a drop-jump test and estimated maximal aerobic power.

CONCLUSION

The present result of the study stated that due to twelve weeks plyometric and aerobics, the subjects have improved their flexibility significantly comparing to control group. Since the differences between the aerobics and plyometric were significant, it was found that aerobics exercises were significantly better than plyometrics.

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