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ORIGINAL ARTICLE

EFFECT OF PLYOMETRIC TRAINING ON SELECTED MOTOR ABILITY COMPONENTS OF SCHOOL GIRLS

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Abstract:

The aim of the study was to find out the effect of plyometric training on selected motor ability components of school girls. For the purpose of the study 30 school girls from Kendra vidyalaya higher secondary school (2), kalapet were randomly selected and their age ranged between 12 to 14 years. Subjects included in the study were not controlled with regard to their life style, diet and habits which may have influenced their performance. They were divided into two groups A, C with 15 subjects in each group. Group A was treated with plyometric training and group C was kept under control group. The subjects of group A underwent training for eight weeks with the duration of 45 minutes. The training was started at 6.30am and it was given for 3 days per week. The pre test and post test on motor ability components was measured using standing broad jump, 50 meters dash test. The data was statistically analyzed by using ANCOVA to find out the significant difference among the two groups. The finding of the study revealed that there was a beneficial effect on explosive power, speed for the experimental groups when compared to the control group.

KEYWORDS:

plyometric, explosive power, speed, motor ability.

INTRODUCTION

Plyometrics is a type of exercise training designed to produce fast, powerful movements, and improve the functions of the nervous system, generally for the purpose of improving performance in sports. Plyometric movements, in which a muscle is loaded and then contracted in rapid sequence, use the strength, elasticity and innervations of muscle and surrounding tissues to jump higher, run faster, throw farther, or hit harder, depending on the desired training goal. Plyometrics is used to increase the speed or force of muscular contractions, providing explosiveness for a variety of sport-specific activities. Plyometrics are useful for several sports - notably football, volleyball, rugby, rowing, basketball, track and field athletics, racket sports, parkour, martial arts, skateboarding, wushu, Breakdancing amongst others.

Plyometric training is a type of exercise designed to increase muscle power. Athletes, basketball players, footballers and sometimes boxers incorporate plyometric training into their training schedule, with the aim of adding additional explosive power to their game. Athletes can gain huge advantage using plyometric training, so long as the exercises are done safely. The main objective of a plyometrics training program is to shorten the time between muscle stretching and contraction. Plyometric training includes high intensity drills such as jumps hops and bounds which results in explosive bursts of power and speed

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MOTOR FITNESS

Motor Fitness refers to the ability of an athlete to perform successfully at their sport. Motor fitness is one aspect of the multidimensional construct of physical fitness which is defined as a "set of attributes that people have or achieve that relates to the ability to perform physical activity". The components of motor or skill-related fitness are important for successful performance in all sports and motor skills and include movement control factors of balance and coordination, and force production factors of agility, power, speed, and reaction time.

METHODOLOGY

SELECTION OF SUBJECTS

To achieve this purpose (N=30) school girls were randomly selected from the Kendra Vidyalaya Higher Secondary School (2), Kalapet, Puducherry-13. The subject's age ranged from 12 to 14 years as per the school records.

The subjects for this study were oriented and the purpose of the study was explained. The testing procedures were explained to them in details, so that there was no ambiguity in their minds. The researcher has demonstrated each test item with explanation. The subjects are participated in this research work with enthusiasm and without any special motivational techniques. The readings of measurements were made known to the subjects with a view to familiarize about their performance. The subjects of the experimental groups received personalized attention and supervision of the trainer in relation to the plyometric training. The training was carried out in the school ground. The training was given for forty five minutes in the morning hours at 6.30am for eight weeks. The subjects living condition and life style were not taken into consideration for this study.

TABLE I
ANALYSIS OF COVARIANCE ON EXPLOSIVE POWER OF PLYOMETRIC TRAINING GROUP AND CONTROL GROUP

	Plyometric Training Group	Control Group	Source of Variance	Sum of Square	df	Mean Square	'F' ratio
Pre – test Mean	1.4600	1.4207	Between	0.012	1	0.012	2.463
S.D.	0.05782	0.07796	Within	0.132	28	0.005	
Post – test Mean	1.5320	1.4227	Between	0.090	1	0.090	22.111*
S.D.	0.05335	0.07255	Within	0.114	28	0.004	
Adjusted Post – test Mean	1.515	1.439	Between	.040	1	.040	61.222*
			Within	.017	27	.001	

*Significant at 0.05 level.
Required table value at 0.05 level of significance for
1 & 28 degrees of freedom = 4.20
1 & 27 degrees of freedom = 4.21

It is observed from table – I that the pre-test mean values of explosive power of the plyometric training group and control group are1.4600 ± 0.05782 and 1.4207 ± 0.07796 respectively. The obtained 'F' ratio value 2.463 for pre test mean is less than the required table value 4.20 for 1 & 28 degrees of freedom at 0.05 level of significance. The statistical analysis reveals that there is no significant difference between the control and the experimental group on explosive power before the commencement of the experimental training. It is inferred that the selection of the subjects for the two groups are successful.

The post-test mean values for explosive power of the plyometric training group and control group are 1.5320 ± 0.05335 and 1.4227 ± 0.07255 respectively. The obtained 'F' ratio value 22.111 post test mean is greater than the required table value 4.20 for 1 & 28 degrees of freedom at 0.05 level of significance. The statistical analysis reveals that there is significant difference between the control and the experimental group on explosive power as a result of the experimental training.

The adjusted post-test mean values of explosive power for plyometric training group and control group are 1.515 and 1.439 respectively. The obtained 'F' ratio value 61.222 for adjusted post-test scores of plyometric training group and control group are greater than the required table value 4.21 for 1 & 28 degrees of freedom at 0.05 level of significance. The result of this study reveals that there is significant difference between plyometric training group and control group on explosive power as a result of the experimental training. Since the result has revealed that there is a significant difference, the hypothesis has been accepted.

The mean values of plyometric training group and control group on explosive power are graphically represented in figure – I

Figure - I

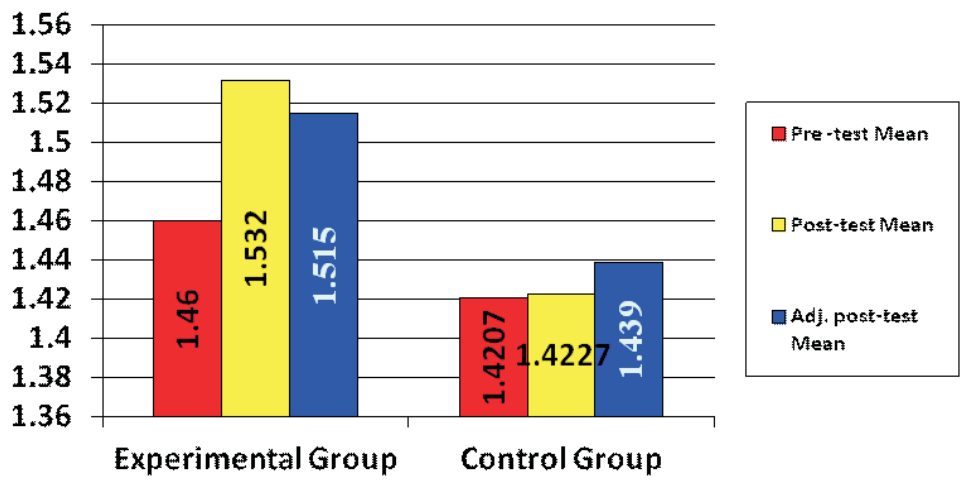

Figure I: Bar Diagram showing the mean values of plyometric training group and control group on explosive power in terms of standing broad jump.

TABLE II
ANALYSIS OF COVARIANCE ON SPEED OF
PLYOMETRIC TRAINING GROUP AND CONTROL GROUP

	Plyometric Training Group	Control Group	Source of Variance	Sum of Square	df	Mean Square	'F' ratio
Pre-test Mean	9.3767	9.3893	Between	0.001	1	0.001	0.949
S.D.	0.57774	0.50148	Within	8.194	28	0.293	
Post-test Mean	9.0813	9.4233	Between	0.877	1	0.877	4.271*
S.D.	0.45176	0.45464	Within	5.751	28	0.205	
Adjusted Post-test Mean	9.086	9.418	Between	0.826	1	0.826	46.104*
			Within	0.484	27	0.018	

*Significant at 0.05 level
Required table value at 0.05 level of significance for
1 & 28 degrees of freedom = 4.20
1 & 27 degrees of freedom = 4.21

It is observed from Table – II that the pre-test mean values of plyometric training group and control group on speed are 9.3767 ±0.57774 and 9.3893 ± 0.50148 respectively. The obtained 'F' ratio value 0.949 for the pre test mean is less than the required table value 4.20 for 1 & 28 degrees of freedom at 0.05 level of significance. The statistical analysis reveals that there is no significant difference between the control and the experimental group on speed before the commencement of the experimental training. It is inferred that the selection of the subjects for the two groups are successful.

The post-test mean values for speed of the plyometric training group and control group are 9.0813 ± 0.45176and 9.4233 ± 0.45464 respectively. The obtained 'F' ratio value 4.271 post test mean is greater than the required table value 4.20 for 1 & 28 degrees of freedom at 0.05 level of significance. The statistical analysis reveals that there is significant difference between the control and the experimental group on speed as a result of the experimental training.

The adjusted post-test mean values of speed for plyometric training group and control group are 9.086 and 9.418 respectively. The obtained 'F' ratio value 46.104 for the adjusted post-test score is greater than the required table value 4.21 for 1 & 27 degrees of freedom at 0.05 level of confidence. The result of this study reveals that there is a significant difference between the control and the experimental group on speed as a result of the training. Since the result has revealed that there is a significant difference, the hypothesis has been accepted.

The mean values of plyometric training group and control group on speed are graphically represented in figure – II

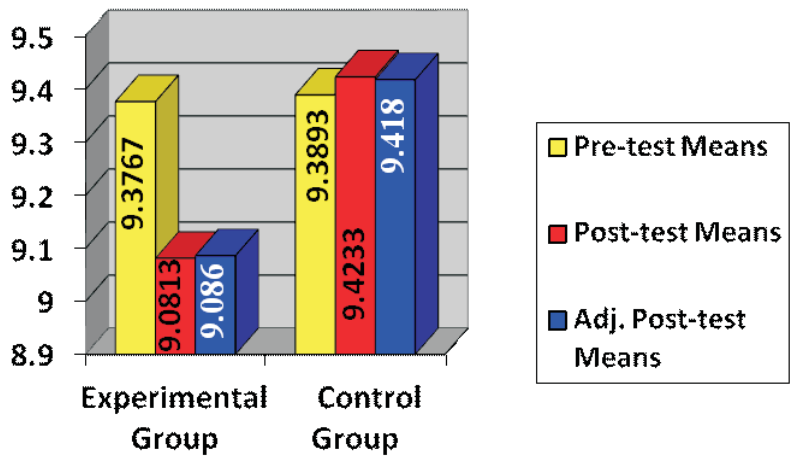

Figure II: Bar Diagram showing the mean values of plyometric training group and control group on speed in terms of 50mtrs Dash

DISCUSSION

The study was framed to analyze the effect of plyometric training on explosive power and speed on school girls (aged 11 to 14years). The subjects were given training on plyometric training for a period of 8 weeks for 3 days per week. The selected motor ability variables are explosive power and speed. The main aim of the study was to enhance the efficiency of motor ability of the school girls.

The result of the study is in consonance with the findings of the following studies by Chen, Shuping (May 2010), Milić. Vladan (October 2008), Holcomb, W.R(May 1996).

CONCLUSION

It was observed from the pre test results, that there is no significant difference among control and experimental groups. While the post test results of control and experimental groups revealed that, there is a significant difference in the experimental group. The training program has influenced the experimental groups where as there is no effect in the control group.

In the analysis of co-variance on explosive power and speed between control and experimental group, a significant difference was revealed which throws light on the application for eight weeks plyometric training. From the statistical analysis it is clear that the training programmes had its own effect.

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