



EFFECT OF PLYOMETRIC TRAINING ON LEG EXPLOSIVE STRENGTH OF SCHOOL GIRLS

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ABSTRACT

The purpose of the present study was to investigate the effect of plyometric circuit training on the leg explosive strength of school girls. To achieve the purpose of the study thirty girls were selected from Mayo College Girls School Ajmer, during the year 2017-18. The subject's age ranges from 15 to 17 years. The subject were divided into two equal groups consists of 15 students each namely experimental group and control group. The experimental group underwent plyometric circuit training for six weeks. The control group was not taking part in any exercise during the course of the study. Vertical jump and standing broad jump were taken as criterion variables in this study. Pre-test was taken before the exercise period and post-test was measured immediately after the six week exercise period. Statistical technique 't' ratio was used to analyze the means of the pre-test and post test data of experimental group and control group. The results shown that there was a significant difference found on the criterion variables. The difference found is due to plyometric circuit training given to the experimental group on vertical jump and standing broad jump when compared to control group.

KEYWORDS : plyometric circuit training, vertical jump and standing broad jump.

INTRODUCTION

The improvement in jumping records in various international competitions (Asian and Olympic) in the past thirty years has witnessed a dramatic change in the positive direction. This has attracted the attention of various physical educationists and sports scientists to analyze the causes for this boom. As the performance in jumping events is largely determined by one's muscular strength and also to a number of other related strength factors the training of athletes therefore, is mainly directed to improve the strength ability of the athletes. Old traditional techniques include the weight training and run jumps. These training techniques are no doubt very effective methods used world over for the training of athletes, but with the recent advent of plyometric which is based on the principle of overload, an improvement of much greater magnitude in the jumping performance has been reported by the research as is also reflected in the improvement in jumping records of athletes in the past 30-40 years. Plyometric drills produce explosive re-active movements since it trains the eccentric part of muscle contraction. The fundamental research in the area was conducted by Russians in the mid and late 1960s. This has unveiled a great potential in the plyometric. Advanced countries which are dominating in the field of sports have been using these techniques (plyometric) for the training of their athletes since the sixties. However, in India which has great genetic potential, very little effort has been made to make use of plyometric method of training. Strong and consistent steps in this direction are the need of the time, but before it is actually applied on Indian athletes/sportsmen, there is a need to prepare a plyometric circuit suitable for Indian athletes. Unfortunately no scientifically prepared and tried Circuit Training Programme is available in our country.

METHODOLOGY

For the purpose of the study was to find out the effect of plyometric circuit training on leg explosive strength among school girls. To achieve this purpose of the study, thirty female students were selected from Mayo College Girls School Ajmer, during the year 2017-18. The subject's age ranges from 15 to 17 years. The selected subjects were divided into two equal groups of fifteen subjects each, such as plyometric circuit training group (Experimental Group) and control group. The experimental group underwent plyometric circuit training for three days per week for six weeks. Control group which they did not undergo any special exercise programme apart from their regular physical activities as per their curriculum. The following variables namely vertical jump and standing broad were selected as criterion variables. Vertical jump was measured by centimeters/meters and standing broad jump was measured by centimeters/meters. All the subjects of two groups were tested on selected criterion variables at prior to and immediately after the exercise programme. The 't' test was used to analysis the significant differences if any in between the groups

respectively. The 0.05 level of confidence was fixed to test the level of significance which was considered as an appropriate.

Experimental Design

This study was formulated as post test group design. One group was assigned plyometric circuit training programmed. The other group acted control group no training programmed.

Selection of Variables

Leg Explosive strength was analyzed by vertical jumps and standing broad jump.

Statistical Technique

The following statistical procedures were used. The "t" ratio was calculated to find out the significance of the difference between the mean of the initial and final test of the experimental group.

ANALYSIS OF THE DATA

The significance of the difference among the means of experimental group was found out by pre-test. The data were analyzed and dependent 't' test was used with 0.05 levels as confidence.

TABLE I ANALYSIS OF 't'-RATIO FOR THE PRE AND POST TESTS OF EXPERIMENTAL AND CONTROL GROUP ON VERTICAL JUMP.

Variable	Group	Mean		SD		Df	't' ratio	
		Pre	Post	Pre	Post			
Vertical jump	Control	1.020	1.022	.145	.136	.006	14	1.757
	Experiment	1.271	1.457	.107	.106	.007		14.021*

***Significance at .05 level of confidence. (The table value required for 0.05 level of significant with df of 14 is 2.14.**

The Table-I shows that the mean values of pre-test and post-test of control group on vertical jump were 1.023 and 1.033 respectively. The obtained 't' ratio was 1.757, since the obtained 't' ratio was less than the required table value of 2.14 for the significant at 0.05 level with 14 degrees of freedom it was found to be statistically insignificant. The mean values of pre-test and post-test of experimental group on vertical jump were 1.281 and 1.375 respectively. The obtained 't' ratio was 14.021* since the obtained 't' ratio was greater than the required table value of 2.14 for significance at 0.05 level with 14 degrees of freedom it was found to be statistically significant. The result of the study showed that there was a significant difference between control group and experimental group in vertical jump. It may be concluded from the result of the study that experimental group improved in vertical jump due to six weeks of plyometric circuit training.

Figure 1; BAR DIAGRAM FOR SHOWING THE PRE AND POST MEAN VALUE OF EXPERIMENTAL GROUPS AND CONTROL GROUP ON VERTICAL JUMP.

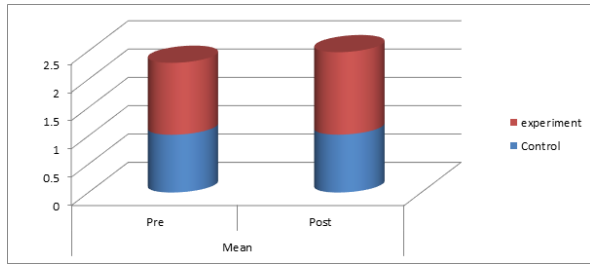


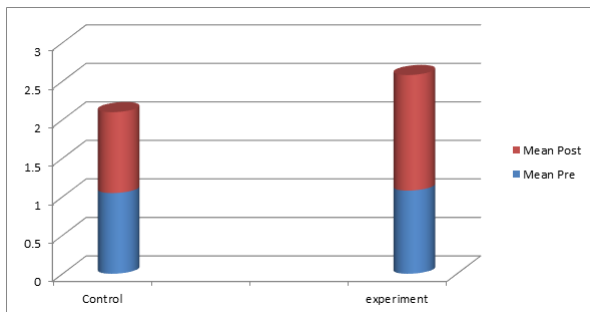
TABLE II ANALYSIS OF 't' RATIO FOR THE PRE AND POST-TESTS OF CONTROL AND EXPERIMENTAL GROUP ON STANDING BROAD JUMP.

Variable	Group	Mean		SD		SD Error	Df	't' ratio
		Pre	Post	Pre	Post			
Standing broad jump	Control	1.048	1.050	.137	.141	.019	14	.343
	experiment	1.080	1.50	.179	.132	.031		9.875*

***Significance at .05 level of confidence. (The table value required for 0.05 level of significant with df of 14 is 2.14)**

The Table - II shows that the mean values of pre-test and post-test of control group on standing broad jump were 1.053 and 1.060 respectively. The obtained 't' ratio was .343 since the obtained 't' ratio was less than the required table value of 2.14 for the significant at 0.05 level with 14 degrees of freedom it was found to be statistically insignificant. The mean values of pre-test and post-test of experimental groups on standing broad jump were 1.097 and 1.405 respectively. The obtained 't' ratio was 9.875* since the obtained 't' ratio was greater than the required table value of 2.14 for significance at 0.05 level with 14 degrees of freedom it was found to be statistically significant. The result of the study showed that there was a significant difference between control group and experimental group in standing broad jump. It may be concluded from the result of the study that experimental group improved in standing broad jump due to six weeks of plyometric circuit training.

Figure I BAR DIAGRAM FOR SHOWING THE PRE AND POST MEAN VALUE OF EXPERIMENTAL GROUP AND CONTROL GROUP ON STANDING BROAD JUMP.



Discussions on Findings

The result of the study indicates that the experimental group namely plyometric circuit training group had significantly improved the selected dependent variables namely vertical jump and standing broad jump, when compared to the control group. It is also found that the improvement caused by plyometric circuit training when compared to the control group.

Conclusions

There was a significant difference between experimental and control group on vertical jump and standing broad jump after the

exercise period. 2. There was a significant improvement in vertical jump and standing broad jump. However the improvement was in favour of experimental group due to six weeks of plyometric circuit training.

REFERENCES;

1. The scientific basis of depth jumping according to Miller and Power (1981) is concentric (shortening) contraction.
2. The mechanical energy gets stored within the muscle (Marey and Demeny, 1885).
3. Many researchers have advocated depth jumping as training aid for improving the jump ability of sportsmen/women (Verhoshansky, 1967; Lenz and Losch, 1979).
4. Recently Walker and Kenneson (1986) have ascribed a catalytic role to plyometric exercises in improving the jumping ability