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Effects of Plymetrics Training and Weight Training on selected Motor Ability Components among University Male Students.

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ABSTRACT

Introduction: The aim of this study was to find out the effects of plyometrics training and weight training among university male students.

Procedure: 60 male students from the different colleges of the Burdwan University were randomly selected as subjects and their age were 19-25 years served as Weight training Group (WTG), second group served as Plyometric Training Group (PTG) and the third group served as Control Group (CT). Eight weeks weight training and six weeks plyometric training were given for experiment accordingly. The control group was not given any training except of their routine. The selected subjects were measured of their motor ability components, speed, endurance, explosive power and agility. ANCOVA was calculation for statistical treatment.

Finding: Plyometric training and weight training groups significantly increase speed, endurance, explosive power and agility.

Conclusion: The plyometric training has significantly improved speed, explosive power, muscular endurance and agility. The weight training programme has significantly improved agility, muscular endurance, and explosive power. The plometric training is superior to weight training in improving explosive power, agility and muscular endurance.

Keywords: Plometric, Weight, training, Speed, Muscular Endurance, Agility.

I. INTRODUCTION

Performance sports aim at high performance and for most physical and psychic capacities of sports men are developed to extreme limits. This normally not happen in other areas of human activities. As a result, performance sports field possess valuable knowledge about the limits to which human performance and various performance factors can be developed. It also leads to discovery of means and methods for improving various physical and psychic capacities (performance factors) to exceptionally high level. This knowledge can be faithful by applied to other areas of sports and human activities.

The science of sports training is a recent to field of sports science. The sports science discipline have improved at a very fast pace in the past few decades. The knowledge gained by these disciplines has to be understood by the coaches and trainers to apply it correctly to the training process. But majority of the coaches do not have sufficient scientific background and training to make full and effective use of the knowledge acquired by the sports science disciplines. This science of training with its workers having sufficient background of science and sports are able to fill this gape and can become mediator between the scientists and the coaches.

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Sports training aims to improving the performance of sports persons. Weight training and Plyometric training are very popular now a days and effective training methods to promote higher performance in sprinting and jumping events. Plyometric training exercises are included depth jumping, hopping, bounding drills etc. Are legs plyometric and medicine ball exercise are arms plyometric exercise; these exercises are used to improve speed, explosive strength and other motor ability components. Weight training is on activities of high intensity, short duration and opposite side low intensity and high volume or build muscle, strength and endurance.

II. METHODOLOGY

Experimental design and assessment of outcome variables;

Subject will be selected randomly from different college from Burdwan University and were assessed before and after 6-week training period using identical testing protocols. Individual participant testing sessions were performed at the college ground and completed within 3 hour. The test included measurements of speed, endurance, muscular endurance, strength, explosive power, flexibility and agility. All participants were instructed to perform each test to maximum affected and verbal encouragement was provided throughout each test. All participants were tested in a specific order so as to standardize the testing process: speed, endurance, muscular endurance, strength, explosive power, flexibility and agility.

Standardized procedures were followed for each of the assessment tests and are published in detail else-where. Speed was assessed via a 50 yard course and a finish line, manually using a handheld stop watches and stating clapper to collect the data and timed was recorded to the nearest 0.01 seconds. Muscular endurance was evaluated using a push-up bend knee sit-up in one minute. Explosive power was evaluated using a vertical jumping and using a wall and recorded by inch and standing long jump using tape and jumping pit and distance was recorded to the nearest 0.01 meter. Agility was assessed the pre-agility shuttle run and timed was recorded to the nearest 0.01 seconds.

Training Protocols;

The functional training protocols will be prepared with the help of latest literature and national and international experts. A separate training protocol for the entire group

1ST Week to 6TH Week- 1ST Training Programme

A. Weight Training Group

Name of Training	Execution/Time	Repetitions	Recovery	Total Time
1. Bench press	30 Seconds	8	Walk back	2min.
2. Biceps curl	30 Seconds	8	Walk back	2min.
3. Shoulder press	30 Seconds	8	Walk back	2min.
4. Leg press	30 Seconds	8	Walk back	2min.
5. Squat	30 Seconds	8	Walk back	2min.
6. Hamstrings curl	30 Seconds	8	Walk back	2min.

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1ST Week to 8TH Week- Training Programme

B. Plyometric Training Group

Name of Training	Execution/Time	Repetitions	Recovery	Total Time
1. 18" high box jumping in both legs	20m/30 Seconds	8	Walk back	2min.
2. Hopping over mini hurdles	20m/30 Seconds	8	Walk back	2min.
3. Two legged hops or bunny hops	20m/30 Seconds	8	Walk back	2min.
4. Medicine ball chest pass with partner-4kg.	20m/30 Seconds	8	Walk back	2min.
5. Medicine ball power drop with partner-4kg	20m/30 Seconds	8	Walk back	2min.
6. Medicine ball chest pass incline position with partner	20m/30 Seconds	8	Walk back	2min.

Statistical Analysis;

The following statistical techniques were used to find out the effects of plyometric and weight training on selected motor ability components among university male students. Analysis of co-variance was used to test the adjusted post test mean differences among the experimental groups. If the adjusted post test result was significant, the Scheffe's post hoc test was used to determine the significance of the paired mean differences (Thirumalaisamy, 1997). The level of significance was fixed at 0.05 levels.

III. RESULTS

The statistical analysis comparing the initial and final means of speed due to plyometric training and weight training on university male students in Table I

Table I

Computation of analysis of co- variance on speed (in seconds)

	Plyometric Training	Weight Training	Control	Source of variance	Sum of squares	df	Mean Squares	Obtained F
Pre Test Mean	7.03	7.08	7.07	Between	0.03	2	0.01	0.19
				Within	4.24	57	0.07	
Post Test Mean	6.95	7.19	7.05	Between	0.54	2	0.27	3.89*
				Within	3.95	57	0.07	
Adjusted Post Test Mean	6.98	7.19	7.04	Between	0.37	2	0.18	12.42*
				within	0.83	56	0.01	
Mean Difference	-0.07	7.17	-0.01					

Table F-ratio at 0.05 level of confidence for 2 and 57(df)=3.15, 2 and 56(df)=3.15. *Significant

Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheff,s Confidence Interval test. The results were presented in Table II.

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Table II

Scheffe,s Confidence Interval Test Scores on Speed

MEANS				Required C.I
Plyometric Training	Weight Training	Control	Mean Difference	
6.98	7.17		-0.19*	0.10
6.98		7.04	-0.07	0.10
	7.17	7.04	0.12*	0.10

***Significant**

The statistical analysis comparing the initial and final means of muscular endurance through sit up in one minute due to plyometric training and weight training on university male students in Table III

Table III

Computation of analysis of co- variance on Muscular Endurance

	Plyometric Training	Weight Training	Control	Source of variance	Sum of squares	df	Mean Squares	Obtained F
Pre Test Mean	31.80	32.30	33.05	Between	15.83	2	7.92	0.57
				Within	794.35	57	13.94	
Post Test Mean	35.40	34.20	32.45	Between	88.03	2	44.02	5.78*
				Within	433.95	57	7.61	
Adjusted Post Test Mean	35.73	34.25	32.07	Between	132.65	2	66.32	20.61*
				within	180.21	56	3.22	
Mean Difference	3.60	1.90	-0.60					

Table F-ratio at 0.05 level of confidence for 2 and 57(df)=3.15, 2 and 56(df)=3.15. *Significant

Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheff,s Confidence Interval test. The results were presented in Table IV.

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Table II

Scheffe,s Confidence Interval Test Scores on Muscular Endurance

MEANS				Required C.I
Plyometric Training	Weight Training	Control	Mean Difference	
35.73	34.25		1.48*	1.42
35.73		32.07	3.66*	1.42
	34.25	32.07	2.17*	1.42

***Significant**

The statistical analysis comparing the initial and final means of Explosive power through vertical jump due to plyometric training and weight training on university male students in Table V

Table V

Computation of analysis of co- variance on Explosive Power

	Plyometric Training	Weight Training	Control	Source of variance	Sum of squares	df	Mean Squares	Obtained F
Pre Test Mean	47.25	47.85	49.85	Between	74.13	2	37.07	0.76
				Within	2770.85	57	48.61	
Post Test Mean	56.05	50.80	48.65	Between	579.63	2	289.82	6.62*
				Within	2494.70	57	43.77	
Adjusted Post Test Mean	56.94	51.19	47.37	Between	906.81	2	453.40	44.00*
				within	577.06	56	10.30	
Mean Difference	8.80	2.95	-1.20					

Table F-ratio at 0.05 level of confidence for 2 and 57(df)=3.15, 2 and 56(df)=3.15. *Significant

Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheff,s Confidence Interval test. The results were presented in Table VI.

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Table VI

Scheffe,s Confidence Interval Test Scores on Explosive Power/Vertical Jump

MEANS				Required C.I
Plyometric Training	Weight Training	Control	Mean Difference	
56.94	51.19		5,75*	2.55
56.94		47.37	9.56*	2.55
	51.19	47.37	3.81*	2.55

***Significant**

The statistical analysis comparing the initial and final means of Agility due to plyometric training and weight training on university male students in Table VII

Table VII

Computation of analysis of co- variance on Agility

	Plyometric Training	Weight Training	Control	Source of variance	Sum of squares	df	Mean Squares	Obtained F
Pre Test Mean	10.88	10.75	10.67	Between	0.41	2	0.21	0.78
				Within	15.17	57	0.27	
Post Test Mean	10.21	10.62	10.69	Between	2.68	2	1.34	5.06*
				Within	15.08	57	0.26	
Adjusted Post Test Mean	10.11	10.64	10.78	Between	4.94	2	2.47	299.49*
				within	0.46	56	0.01	
Mean Difference	-0.66	-013	-0.02					

Table F-ratio at 0.05 level of confidence for 2 and 57(df) =3.15, 2 and 56(df) =3.15. *Significant

Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheff,s Confidence Interval test. The results were presented in Table VIII.

Table VIII
Scheffe,s Confidence Interval Test Scores on Agility

MEANS				Required C.I
Plyometric Training	Weight Training	Control	Mean Difference	
6.98	10.64		-0.53*	0.07
6.98		10.78	-0.68*	0.07
	10.64	10.78	-0.15*	0.07

***Significant**

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IV. DISCUSSION

As shown in Table I, Table III, Table V ,and Table VII the obtained F value on the pre test means 0.19,0.57, 0.76 and 0.78 was less the required F value, which proved that the random assignment of the subjects were successful and their scores in speed before the training were equal and there was no significant differences.

Taking into consideration of the pre test means and post test means adjusted post test means were determined and analysis of covariance was done and the obtained F value 12.42 was greater than the required value of 3.15 and hence it was accepted that the plyometric training and weight training significantly improved the speed of the subjects. The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between control group and plymetric training group and control group and weight training group. This proved that due to eight weeks plyometric training of college athletes improved significantly, but the weight training group did not improved but has reduced their performance in speed. While considering the two training methods, from the results presented in Table I it was found that plyometric training is better than weight to improved speed.

Taking into consideration of the pre test means and post test means adjusted post test means were determined and analysis of covariance was done and the obtained F value 20.61 was greater than the required value of 3.15 and hence it was accepted that the plyometric training and weight training significantly improved the muscular endurance of the subjects.The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between control group and plymetric training group and control group and weight training group. This proved that due to eight weeks plyometric training of college athletes improved significantly. In the same waya, eight weeks weight training also improver muscular endurance significantly. While comparing plyometric training and weight training, the mean difference of 1.48 was greater than the required value of 1.42. Hence, it was proved that plyometric training is better than weight training to improved muscular endurance of the college male students.

Taking into consideration of the pre test means and post test means adjusted post test means were determined and analysis of covariance was done and the obtained F value 44.00 was greater than the required value of 3.15 and hence it was accepted that the plyometric training and weight training significantly improved the on explosive power of the subjects. The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between control group and plymetric training group and control group and weight training group. This proved that due to eight weeks plyometric training of college athletes improved significantly. While considering the two training methods, from the results presented in Table V it was found that plyometric training is better than weight to improved explosive power of the subjects.

Taking into consideration of the pre test means and post test means adjusted post test means were determined and analysis of covariance was done and the obtained F value 299.49 was greater than the required value of 3.15 and hence it was accepted that the plyometric training and weight training significantly improved the on agility of the subjects. The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between control group and plymetric training group and control group and weight

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training group. This proved that due to eight weeks plyometric training of college athletes improved significantly. While considering the two training methods, from the results presented in Table VII.

IV. CONCLUSION

In conclusion, the present investigation observed that the plyometric training has significantly improved speed, explosive power, muscular endurance and agility of university male students. The researcher also observed that the weight training programme has significantly improved agility, muscular endurance, and explosive power of university male students. Finally the researcher concluded that the plometric training is superior to weight training in improving explosive power, agility and muscular endurance of university male students.

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