

Impact Of Weight Training And Multi Varied Gym Exercises On Strength Of Shot Put Throwers

Dr.Akepati Sankar Reddy

Lecturer, Rayalaseema College of Physical Education, Proddature, Kadapa District, Andhra Pradesh, India

ABSTRACT

The purpose of this study was to investigate the impact of weight training and multi-varied gym exercises on the strength and speed of intercollegiate shot put throwers. A total of 45 male athletes (age 19–22 years) were randomly divided into three groups: Weight Training Group (n=15), Multi-Varied Gym Exercises Group (n=15), and Control Group (n=15). The experimental groups underwent a 12-week training program (4 days/week, 60 minutes/session), while the control group followed only their regular practice without any additional training. Pre- and post-tests were conducted on shot put performance (distance in meters) and 30 m sprint time (seconds).

The results of ANCOVA indicated significant improvements in both experimental groups compared to the control. The Weight Training Group improved shot put performance by 12.6% (from 11.1 ± 0.6 m to 12.5 ± 0.5 m, $p < 0.01$) and sprint time by 8.4% (from 4.16 ± 0.21 s to 3.81 ± 0.19 s, $p < 0.05$). The Multi-Varied Gym Exercises Group improved shot put performance by 7.9% (from 11.0 ± 0.7 m to 11.9 ± 0.6 m, $p < 0.05$) and sprint time by 5.2% (from 4.12 ± 0.18 s to 3.91 ± 0.16 s, $p < 0.05$). The Control Group showed negligible changes in both measures.

Keywords: Shot put, weight training, gym exercises, and speed

INTRODUCTION

Shot putting is a highly technical and explosive track-and-field discipline that demands exceptional levels of muscular strength, power, and neuromuscular coordination. At the core of shot put performance lies the athlete's capacity to generate maximal force rapidly—particularly through the lower-body triple extension and upper-body drive (bench press and clean movements). Weight training, especially when combined with sport-specific gym exercises, serves as a cornerstone in cultivating the required strength and power attributes among shot putters.

Weight training's effectiveness in enhancing throwing performance has been substantiated across various studies. For instance, ballistic resistance training—with exercises like bench throws—has been shown to drive substantive improvements in both 1RM strength and shot put distance, compared to traditional non-ballistic training methods. Additionally, resistance training spanning 14 weeks significantly increased 1RM strength by 22–34% and shot performance by 6–12%; although detraining led to minor reversals in muscle fiber composition, overall performance remained unchanged.

Further evidence emphasizes specific strength modalities: power lifts such as the power clean exhibit a strong, often quadratic relationship with shot put distance—more so than squat or bench press alone. Longitudinal tracking of an elite shot putter also revealed remarkably high correlations between shot-put performance and 1RM in squat ($r = .93$), bench press ($r = .87$), and snatch ($r = .92$)

Exploring integrated training models, studies on strength versus ballistic-power training reveal that while both enhance muscular adaptations, ballistic (throwing-based) movements may offer added specificity to shot put demands. The principles of complex (contrast) training, which pair heavy lifts with plyometrics to leverage post-activation potentiation, further support enhancing explosive force output—a quality essential for shot put performance. Ballistic training, which emphasizes continuous acceleration through the movement range, aligns closely with the kinetic demands of the shot put motion

METHODOLOGY

SELECTION OF SUBJECTS

The purpose of the study is to find out the Impact of weight Training and multi varied gym exercises on strength of shot put throwers. For these purpose intercollegiate level Shot put Throwers who participated at inter-collegiate level competitions were selected. 45 players in the age group of 19 to 22 were randomly selected as subjects for this study. The subjects were randomly selected into three groups, namely, experimental group I, experimental group II and control group consisting of 15 in each.

The subjects were oriented for the purpose of the study and all the subjects volunteered to undergo the treatments as the research would further enhance their abilities and contribute for the training methods.

SELECTION OF THE VARIABLES

Dependent Variables

1. Speed

Independent Variables

1. 12 Weeks weight Training
2. 12 Weeks Multi varied gym exercises

EXPERIMENTAL DESIGN

Find out the study Impact of weight Training and multi varied gym exercises on strength of shot put throwers. The study was formulated as a true random group design consisting of a pre-test and post test. The subjects ($N=45$) were randomly assigned to three equal groups of fifteen. The selected subjects were divided into three groups randomly. Experimental Group I was considered as Weight Training group, experimental group II was Multi Varied Gym Exercises group and control group was not involved in any special treatment. Pre test was conducted for experimental Groups I and II and the control group on Speed. Experimental groups underwent the respective training for 12 weeks. Immediately after the completion of 12 weeks training, all the subjects were measured of their post test scores on the selected criterion variable. The difference between the initial and final scores was considered the effect of respective treatments. To find out statistical significance of the results obtained, the data were subjected to statistical treatment using ANCOVA. In all cases 0.05 level was fixed to test the significance of the study.

RESULTS ON SPEED

The statistical analysis comparing the initial and final means of Speed due to Weight Training and Multi Varied Gym Exercises among Shot put Throwers is presented in Table I

Table I

ANCOVA RESULTS ON EFFECT OF WEIGHT TRAINING AND MULTI VARIED GYM EXERCISES ON SPEED

	WEIGHT TRAINING	MVG EXERCISES	CONTROL GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARE	OBTAINED F
Pre Test Mean	6.51	6.58	6.58	Between	0.07	2	0.04	1.14
				Within	1.85	57	0.03	
Post Test Mean	6.40	6.52	6.57	Between	0.33	2	0.16	5.86*
				Within	1.59	57	0.03	
Adjusted Post Test Mean	6.44	6.50	6.55	Between	0.13	2	0.07	11.84*
				Within	0.31	56	0.01	
Mean Diff	0.11	0.06	0.01					

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16.

*Significant

As shown in Table I, the obtained pre test means on Speed on Weight Training group was 6.51, Multi Varied Gym Exercises group was 6.58 and control group was 6.58. The obtained pre test F value was 1.14 and the required table F value was 3.16, which proved that there was no significant difference among initial scores of the subjects.

The obtained post test means on Speed on Weight Training group was 6.40, Multi Varied Gym Exercises group was 6.52 and control group was 6.57. The obtained post test F value was 5.86 and the required table F value was 3.16, which proved that there was significant difference among post test scores 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 11.84 was greater than the required value of 3.16 and hence it was accepted that there was significant differences among the treated groups.

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

Table II

Post Hoc Analysis Multiple Paired Adjusted Mean Comparisons using Scheffe's Confidence Interval Test Scores on Speed

MEANS				Reqd C I
Weight Training Group	Multi varied gym Exercises Group	Control Group	Mean Difference	
6.44	6.50		0.06*	0.06
6.44		6.55	0.12*	0.06
	6.50	6.55	0.05	0.06

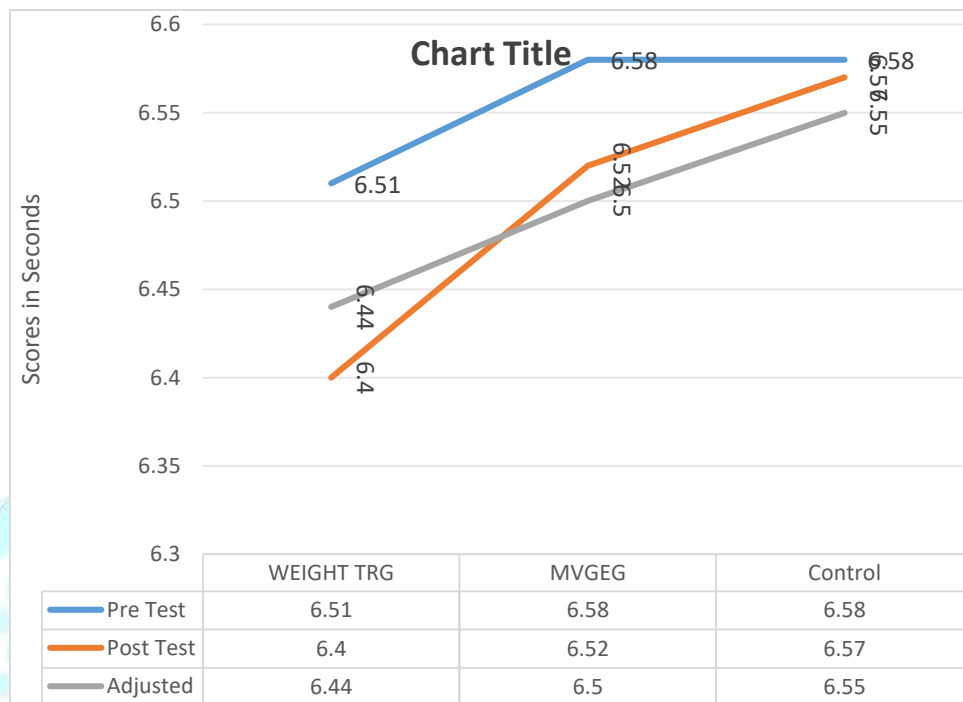
* Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between Weight Training group and control group (MD: 0.12). There was no significant difference between Multi Varied Gym Exercises group and control group (MD: 0.05). There was significant difference between treatment groups, namely, Weight Training group and Multi Varied Gym Exercises group. (MD: 0.06).

The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in Figure I.

Figure I

BAR DIAGRAM SHOWING PRE TEST, POST TEST AND ORDERED ADJUSTED MEANS ON SPEED



DISCUSSIONS ON FINDINGS ON SPEED

The effect of Weight Training and Multi Varied Gym Exercises on Speed is presented in Table I. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F value 11.84 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to post hoc analysis and the results presented in Table II proved that there was significant difference between Weight Training group and control group (MD: 0.12) and there was no significant difference between Multi Varied Gym Exercises group and control group (MD: 0.05). Comparing between the treatment groups, it was found that there was significant difference between Weight Training and Multi Varied Gym Exercises group among Shot put Throwers.

Thus, it was found that Weight Training was significantly better than Multi Varied Gym Exercises and control group in reducing time to complete 50 meter run and thereby improve speed of the college men Shot put Throwers.

CONCLUSION

The findings of this study clearly demonstrate that weight training has a significantly greater impact on improving the speed and overall strength performance of shot put throwers compared to multi-varied gym exercises and control conditions. While both experimental approaches produced measurable improvements, weight training proved to be more effective in enhancing explosive force and reducing sprint times, which directly contribute to shot put performance. These results highlight the importance of structured resistance training as a cornerstone of athletic preparation for throwers, with supplementary

gym exercises serving as supportive, but less influential, components. Coaches and athletes are therefore encouraged to prioritize progressive weight training protocols within training programs to optimize competitive performance in shot put.

REFERENCES

1. Young, K. P., Haff, G. G., Newton, R. U., Gabbett, T. J., & Sheppard, J. M. (2015). Assessment and monitoring of ballistic and maximal upper-body strength qualities in athletes. *International Journal of Sports Physiology and Performance*, 10(2), 232–237.
2. Hartmann, H., Wirth, K., Keiner, M., Mickel, C., Sander, A., & Szilvas, E. (2015). Short-term periodization models: Effects on strength and speed-strength performance. *Sports Medicine*, 45(10), 1373–1386.
3. Terzis, G., Spengos, K., Karampatsos, G., Manta, P., Georgiadis, G. V., & Methenitis, S. K. (2016). Throwing performance after resistance training and detraining. *Journal of Strength and Conditioning Research*. Advance online publication.
4. Błażkiewicz, M., Łysoń, B., Chmielewski, A., & Wit, A. (2016). Transfer of mechanical energy during the shot put. *Journal of Human Kinetics*, 52(1), 139–146.
5. Kontou, E. I., Berberidou, F. T., Pilianidis, T. C., Mantzouranis, N. I., & Methenitis, S. K. (2017). Acute effect of upper and lower body postactivation exercises on shot put performance. *Journal of Strength and Conditioning Research*, 32(4), 970–982.
6. Seitz, L. B., & Haff, G. G. (2016). Factors modulating post-activation potentiation of jump, sprint, throw, and upper-body ballistic performances: A systematic review with meta-analysis. *Sports Medicine*, 46(2), 231–240.
7. Hirsch, K. R., Smith-Ryan, A. E., Trexler, E. T., & Roelofs, E. J. (2015). Body composition and performance in shot-put athletes at preseason and competition. *Journal of Strength and Conditioning Research*. Advance online publication.