REVIEW OF RESEARCH
ISSN: 2249-894X
IMPACT FACTOR : 5.7631(UIF)
VOLUME - 10 | ISSUE - 9 | JUNE - 2021

ISOLATED COMBINED AND COMPLEX RESISTANCE TRAINING IMPACT ON HAMMER THROW PERFORMANCE

Shaik Noorjahan Begum[1] and Dr. P. Johnson[2]
[1]Ph.D Research Scholar, University College of Physical Education and Sports sciences, Acharya Nagarjuna University, AP.
[2]Dean, University College of Physical Education and Sports Sciences, Acharya Nagarjuna University, AP.

ABSTRACT

The present study was undertaken to analyze the isolated, combined and complex resistance training on hammer throw performance. Total N=60 male college level hammer thrower age ranging from 17-23 years selected from various colleges of Guntur district of Andhra Pradesh . The chosen thrower for the study were randomly divided into five groups each group n=12 hammer thrower i.e. empirical group I hammer thrower underwent: weight training [WTG], empirical group II hammer thrower underwent: plyometric training [PTG], empirical group III underwent: combined weight and plyometric training [CWPTG], empirical group IV underwent: complex resistance training [CRTG] and control hammer thrower group [CG]. CG was restricted to participate in any activities. The training period was for a twelve weeks. The data were collected before and after the training by conducting hammer throw test. The obtained data's were analyzed by Analysis of Covariance (ANCOVA). The level of significant was fixed at 0.05 levels. The results of the study showed that isolated, combined and complex resistance training had positive significant impact to increase the hammer throw performances of empirical group's throwers comparative to control group.

KEYWORDS: *weight, plyometric, complex and hammer throw.*

INTRODUCTION

Weight training exercises benefit all the throwers. Trainers specifically focus on general overall strength, which are most beneficial for the hammer events. When throwers trying to put a heavy object (hammer) and body in synchronous rotation. Muscular strength is needed for counter balancing the centrifugal force (outward force) by the hammer and to get into and hold the key positions during the throw. So hammer thrower must build strong shoulder girdle and back as well as having strong stabilizer muscles for all continuous tension and balancing involved in a hammer throw. A great finish in a hammer throw releases the energy created in the turns through an explosive upward lifting of the legs, hips, back, and arms in a smooth, controlled, forceful movement.

The weight training followed by a matched plyometric exercises, set for set, in the same workout used for developing athletic power. An example of complex training include performing a set of bench press followed by clap push up, a set of squat followed by vertical jump, (Chu, 1998; Ebben and

Blackard, 1998). A brief review of complex training suggested that complex training has an acute ergogenic positive effect to increase upper body power of hammer thrower and the results of acute and chronic complex training include positive gain in jumping performance of athletes. Improved upper body and jumping performance require 3-4 minutes rest between the weight training and plyometrics sets and the use of heavy weight training loads (William 2002). The 12-weeks of complex training significantly improved the explosive power of football players (Aditya 2014). Complex training is an effective training regimen to enhance muscular strength, power and speed of athletes (Lesinski et al., 2001). The scientific studies proved that power in specific sports actions improved with the complex training (Mihalik 2008, & sale 1992).

STATEMENT OF THE PROBLEM:

The purpose of the study was to analyze the "isolated, combined and complex resistance training on hammer throw performance".

Hypothesis:

- It was hypothesis that there will be a significant increase in hammer throw performance of empirical groups hammer throwers after the twelve weeks impact of isolated, combined and complex resistance training when compared with control group hockey players.
- There would be significant changes between isolated, combined and complex resistance training group.

METHODOLOGY:

The purpose of this study was to analyze the isolated, combined and complex resistance training on hammer throw performance. Total N=60 male college level hammer thrower age ranging from 18-22 years selected from various colleges of Guntur district of Andhra Pradesh . The chosen thrower for the study were randomly divided into five groups each group n=12 hammer thrower i.e. empirical group I hammer thrower underwent: weight training [WTG], empirical group II hammer thrower underwent: plyometric training [PTG], empirical group III underwent: combined weight and plyometric training [CWPTG], empirical group IV underwent: complex resistance training [CRTG] and control hammer thrower group [CG]. CON were restricted to participate in any activities. The training period was for a twelve weeks. The data were collected before and after the training by conducting hammer throw test. The obtained data's were analyzed by Analysis of Covariance (ANCOVA). The level of significant was fixed at 0.05 levels. The results of the study showed that isolated, combined and complex resistance training had positive significant impact to increase the hammer throw performances of empirical group's throwers comparative to control group. The level of significant was fixed at 0.05 levels.

Table - I

Analysis of Covariance for Hammer Throw performance on Pre Test and Post Test Data of Experimental groups and Control Groups Hammer Throwers (In Meters)

Groups	WTG	PTG	CWPTG	CRTG	CG	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F'
Pre Test Mean	25.29	25.32	24.54	24.14	24.23	Between	15.44	4	3.86	1.39
SD	1.37	1.60	1.93	1.89	1.63	Within	152.74	55	2.77	
Post Test Mean	29.72	29.57	32.41	32.76	23.49	Between	663.10	4	165.77	94.77
SD	0.56	0.64	0.96	2.20	1.48	Within	96.20	55	1.74	
Adjusted Post Test Mean	29.46	29.30	32.48	33.01	23.70	Between	658.47	4	164.61	134.66
						Within	66.01	54	1.22	
Mean Diff	4.43	4.25	7.87	8.62	-0.74	-	-	-	-	-

Table F-ratio value at 0.05 level of confidence for 4 and 55 (df) =2.54, 4 and 54 (df) =2.54
*Significant

The above table-I shows that there is a significant difference on hammer throw performance among the five groups such weight training group hammer thrower [WTG], plyometric training group hammer thrower [PTG], combined weight and plyometric training group hammer thrower [CWPTG] and control hammer thrower group [CG]. Since the calculated 'F' value required being significant at 0.05 level for 4, 55 d/f and 4, 54 are 2.54 and 2.54, but the calculated values of hammer throw performance post and adjusted posttest 'F' values are 94.77 and 134.66 respectively. Which are higher than the tabulated value. Since the obtained 'F' ratio is found significant.

Table - II

The Scheffes Test for the Mean Differences Between Paired Mean of Groups on Hammer throw performance

WTG	PTG	CWPTG	CRTG	CG	MD	CI
29.46	29.30	-	-	-	0.16	1.43
29.46	-	32.48	-	-	3.02*	
29.46	-	-	33.01	-	3.55*	
29.46	-	-	-	23.70	5.76*	
-	29.30	32.48	-	-	3.18*	
-	29.30	-	33.01	-	3.71*	
-	29.30	-	-	23.70	5.60*	
-	-	32.48	33.01	-	0.53	
-	-	32.48	-	23.70	8.78*	
-	-	-	33.01	23.70	9.31*	

Significant at 0.05 level of confidence

Table:-II The hammer throw performance in meter adjusted mean differences between weight training group hammer thrower (WTG) and combined weight and plyometric training group hammer thrower (CWPTG), weight training group hammer thrower (WTG) and complex resistance training group hammer thrower (CRTG), weight training group hammer thrower (WTG) and control hammer thrower group (CG), plyometric training group hammer thrower (PTG) and combined weight and plyometric training group hammer thrower (CWPTG), plyometric training group hammer thrower (PTG) and complex resistance training group hammer thrower (CRTG), plyometric training group

hammer thrower (PTG) and control hammer thrower group (CG),), combined weight and plyometric training group hammer thrower (CWPTG) and control hammer thrower group (CG) and complex resistance training group hammer thrower (CRTG) and control hammer thrower group (CG) were 3.02, 3.55, 5.76, 3.18, 3.71, 5.60, 8.78 and 9.31. Whereas mean differences values was higher than the confidence interval value 1.43. Hence, study proved that there is significant differences exist between the groups after the twelve weeks of training impact.

The hammer throw performance in meter adjusted mean differences between weight training group hammer thrower (WTG) and plyometric training group hammer thrower (PTG) and combined weight and plyometric training group hammer thrower (CWPTG) and complex resistance training group hammer thrower (CRTG) were 0.16 and 0.53. Whereas mean differences values is lower than the confidence interval value 1.43. Hence, study proved that there is no significant differences exist between the groups after the twelve weeks of training impact.

For clear understanding purpose, pre- test, post- test and adjusted post- test mean values of hammer throw performance are presented in line graph figure – 1

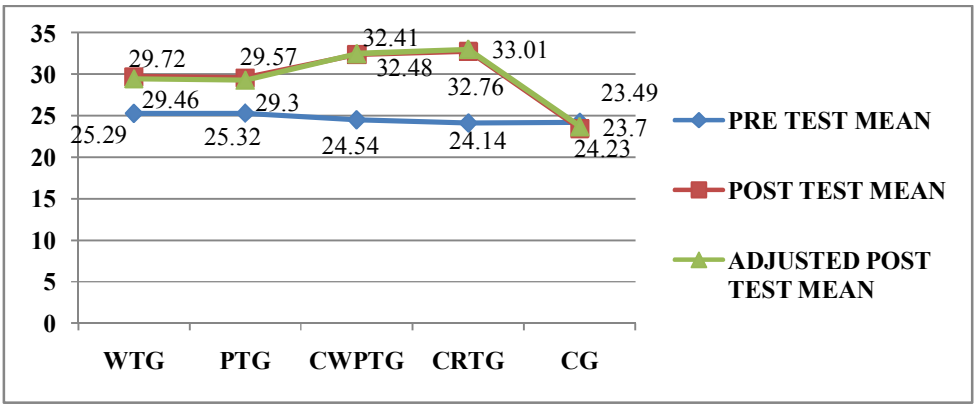

Figure 1: Graphical Illustration Showing the Pre-Test Post-Test and Adjusted Post-Test Mean Values on hammer throw performance

Discussion on Hypothesis:

- In the first hypothesis, it was stated that there will be a significant increase in hammer throw performance of empirical groups hammer throwers after the twelve weeks impact of isolated, combined and complex resistance training when compared with control group hammer thrower. The statistical analysis proved that isolated, combined and complex resistance training significantly increased the hammer throw performance. Hence research hypothesis accepted
- In the second hypothesis, it was stated that there would be significant changes between isolated, combined and complex resistance training group. The statistical analysis proved no significant differences. Hence null hypotheses accepted.

DISCUSSION AND FINDINGS:

On the bases of analysis, found that hammer throw performance of the trained groups hammer throwers increased with the impact of isolated, combined and resistance training. The studies on throwing performance were Nikolaos et al., (2013) proved that shot put performance had increased after 6-weeks of either strength or ballistic power training in novice throwers. Enikolaos et al., (2014) concluded that thrower performance increased similarly after tapering with light loads or heavy load training in track and field thrower, but heavy load training leads to greater increase in strength and whole body power. Dusan et al., (2015) found that with an increase of external resistance load (throwing increasingly heavier balls) the role of force increases with a proportional decrease of impact of technique. Hamed (2020) found that medicine balls training significantly improve the shot put, disc-

throwing, spear-throwing, discus throw and hammer throw performance of the athletes. Hyeyoung et al., (2014) study suggested that 8-weeks of specific training is useful for preventing shoulder injuries and enhances the technique of javelin thrower. Briedenham et al., (2009) study indicated that javelin throw performance, isokinetic shoulder flexion strength and knee extension strength significantly improved in high-school athletes. Giorgos et al., (2013) found that counter movement jumping and sprinting training just before hammer throwing is useful method to increase the hammer throw performance of hammer throwers.

CONCLUSIONS:

On the bases of analysis, it was concluded that isolated, combined and complex resistance training program had positive effect to produced greater power to throw hammer. Combined weight and plyometric training [CWPTG] and complex resistance training program [CRTG] was better than isolated weight training program [WTG] and plyometric training program [PTG] to produced greater power to throw hammer. Therefore, there is no significant difference between weight training program [WTG] and plyometric training program [PTG], and combined weight and plyometric training [CWPTG] and complex resistance training program [CRTG] on hammer throw performance.

REFERENCES

Aditya Kumar Das (2014) Effect of complex training with core exercises program on selected bio motor physiological and skill related variables of football players, Pondicherry University.

Boyle, M. (2016) New Functional Training for Sports, 2nd ed. Champaign, IL. Human Kinetics.

Briedenham. D, Cilliers JF, Shaw BS, Shaw. I and Toriola AL (2009) Effects of off-season strength and plyometric training programmes on isokinetic strength and javelin throwing performance, African Journal for Physical activity and health science.

Chu D.A. (1998) Jumping into plyometrics. 2nd ed Human Kinetics, Champaign, Ill.

Clark, MA, et al., (2018) NASM Essentials of Personal Fitness Training 6th ed. Burlington, MA. Jones & Bartlett Learning.

Dusan Peric, Dragan Kuburovic, Milan Nesic, Fahrudin Mavric, Bojan Međedovic, Srdan Milosavljevic (2015) Impact of muscle strength and sport technique on throwing distance of balls of various weights with a dominant arm, International Journal of Sports Science, 5(5): 213-220.

Enikolaos D. Zaras, Angeliki-Nikoletta E. Stasinaki, Argyro A. Krase, Spyridon K. Methenitis, Giorgos P. Karampatsos, Giorgos V. Georgiadis, Konstantinos M. Spengos and Gerasimos D. Terzis (2014) Effects of tapering with light vs. heavy loads on track and field throwing performance, Journal of strength and conditioning research, 28(12).

Giorgos Karampatsos , Gerasimos Terzis, Christos Polychroniou, Giorgos Georgiadis (2013) Acute effects of jumping and sprinting on hammer throwing performance, Journal of Physical Education and Sport, 13(1), 3 – 5.

Hamed Bassam Salameh (2020) The effect of a proposed training program using medicine balls on some physical variables and the digital achievement of throwing events in athletics for students of physical education, International Journal of Physical Education, Sports and Health, 7(2): 80-84.

Hyeyoung Kim, Youngsun Lee, Insik Shin, Kitae Kim, Jeheon Moon (2014) Effects of 8 weeks' specific physical training on the rotator cuff muscle strength and technique of javelin throwers, J. Phys. Ther. Sci., 26(10).

Lesinski. M, Muehibauer .T, Busch. D and Granacher. U (2014) Effects of complex training on strength and speed performance in athletes: a systematic review, Sportverletz Sportschaden.

Mihalik J.P, Libby. J, Battaglini C.L and McMurray R. G (2008) Comparing short-term complex and compound training programs on vertical jump height and power output, Journal of Strength and Conditioning Research 22, 47–53.

Nikolaos Zaras, Konstantinos Spengos, Spyridon Methenitis, Constantinos Papadopoulos, Giorgos Karampatsos, Giorgos Georgiadis, Aggeliki Stasinaki, Panagiota Manta, and Gerasimos Terzis (2013) Effects of strength vs. ballistic-power training on throwing performance, Journal of sports science and medicine, 12(1): 130–137.

Sale D. G, (1992) Neural adaptation to strength training, in: Strength and Power in Sport, P.V. Komi, ed., London: Blackwell Scientific Publications.

William H. Otto, Jared w. Coburn, Lee e. Brown, and Barry A. Spiering (2012) Effects of weightlifting vs. kettle bell training on vertical jump, strength, and body composition, Journal of Strength and conditioning research, 26(12).