

Enhancement of Speed Through Low, Moderate and High Intensity Resistance Training Programmes among College Women Athletes

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Abstract

Aim of the study was to find out the improvement of Speed through Low Moderate and High Intensity Resistance Training Programs among College Women Athletes. For this purpose sixty (N=60) women students who had taken part in the inter polytechnic athletic meet during the year 2019-2020 were chosen as subjects. Subjects were classified into four groups of fifteen each i.e., (n=15) Group-I experienced Low Intensity Resistance Training(LIRT), Group-II experienced Medium Intensity Resistance Training(MIRT), Group-III experienced High Intensity Resistance Training (HIRT) and Group-IV acted as Control. The Experimental group undergoes the particular training which was allotted to them for a period for 36 sessions. Speed only chosen for this investigation and it was measured through 50 meters sprint test. The collected pre and post information's were factually investigated with dependent 't'- test and Analysis of covariance (ANCOVA). The Scheffe's Post hoc test was applied to decide the paired mean contrasts. The degree of certainty was fixed at 0.05 level for all the cases. The results of the study showed that, MIRT is better than LIRT and HIRT. Further the study showed when compared to the investigation groups, control group (CG) was not improved the certain components.

Keywords: Low Intensity Resistance Training (LIRT), Medium Intensity Resistance Training(MIRT), High Intensity Resistance Training(HIRT), Speed

INTRODUCTION

Sports are basic piece of the arrangement of instruction. Training is an arrangement of cycle where female athletes improve their. Wellness to satisfy the needs of their games. Training utilizes both general and explicit activities to build up the female hockey players for their games. Resistance Training alludes to the training that utilizes some sort of protection from the compression of a strong power [1].

Strength and Resistance training exercise is one of most significant kinds of exercise that will be performed regularly. It is profiting the people by expanding strength of bones, muscles and connective tissues; by bringing down danger of cardiovascular injury and in this manner giving better personal satisfaction [2].

Resistance training is a type of exercise for the development of size of body skeletal muscles and muscular strength of the person [3]. Resistance training is an essential tools to attaining the total fitness for every human being. Through Resistance training the physical of the athletes are looking stronger than others [4]. Resistance training exercises leads the muscle to active the external force [5]. Many studies have proved the various effects of resistance training; overload stress following resistance training resulted to developed muscle strength and the cross-sectional area of muscle fibers, improves efficient muscular works [6]. Resistance training is a important training to all the fitness programmes for the athletes who exercise for the health benefits [7].

Resistance training programs have generally centered around creating maximal strength in individual muscles, underlining one plane of movement. Since all muscles work unusually, isometrically, and concentrically in each of the three planes of movement at various paces, preparing projects should be planned utilizing a reformist methodology that stresses the fitting activity determination, all muscle activities, and reiteration rhythms [8].

The aim of the present study was to investigate the improvement of Speed related Parameters through Low Moderate and High Intensity Resistance Training Programs among College Women Athletes.

MATERIAL AND METHODS

Participants

Sixty healthy female athletes volunteered to participate in this study. All the subjects were members to the same team, participating in no more than 3 times per week in Low Moderate and High Intensity Resistance Training. The subjects were randomly assigned to a 3 training group (Low Intensity Resistance Training (LIRTG n=15), Moderate Intensity Resistance Training(MIRTG, n=15) & High Intensity Resistance Training, (HIRTG, n = 15) and a control group (CG, n = 15). A composed educated agree to take an interest in the examination was given by all members and their folks after they were educated regarding all dangers, distresses and advantages engaged with the investigation.

Procedure

For two weeks before the tests, the athletes performed a program to protect players from injuries. The program included Shoulder press, Bench press, Heel raise, half squat, Arm curl, Bent over row, Military Press, Upright row and Dead lift. Also in this period the athletes familiarized with the tests which accomplished in an indoor gymnasium. Speed was selected as criterion variable.

Speed Testing

After a short warm-up period, the subjects took standing beginning situation behind the beginning line. To get better outcome, two subjects ran simultaneously. The time passed from the "clap" to the sprinter crossing the finishing line was taken as grade. The parts were adjusted to the following biggest one 100th of a second. Two preliminaries were led with adequate rest in the middle of and the better of the two preliminaries were recorded. The time taken to run the 50 meters distance was estimated in 1/100th of a second [9].

Training Programme

Three training programmes namely LIRT, MIRT and HIRT were designed scientifically. The scientifically designed programmes were given to the subjects of respective groups such as LIRT group, MIRT group and HIRT group. The detailed procedures of these three training programmes are dealt with in detail in Table 1 to 3.

Table 1. Low Intensity Resistance Training Programme

Exercises	Phase- I (1 to 4 weeks)				Phase- II (5 to 8 weeks)				Phase- III (9 to 12 weeks)			
	Intensity	Repetition	Sets	Rests	Intensity	Repetition	Sets	Rests	Intensity	Repetition	Sets	Rests
Shoulder press	50%	8-10	2	12 min	50%	10-12	2	10 min	50%	12-14	3	8 min
Bench press	50%	8-10	2	12 min	50%	10-12	2	10 min	50%	12-14	3	8 min
Heel raise	50%	8-10	2	12 min	50%	10-12	2	10 min	50%	12-14	3	8 min
Half squat	50%	8-10	2	12 min	50%	10-12	2	10 min	50%	12-14	3	8 min
Arm curl	50%	8-10	2	12 min	50%	10-12	2	10 min	50%	12-14	3	8 min
Bent over row	50%	8-10	2	12 min	50%	10-12	2	10 min	50%	12-14	3	8 min
Military Press	50%	8-10	2	12 min	50%	10-12	2	10 min	50%	12-14	3	8 min
Upright row	50%	8-10	2	12 min	50%	10-12	2	10 min	50%	12-14	3	8 min
Dead lift	50%	8-10	2	12 min	50%	10-12	2	10 min	50%	12-14	3	8 min

Table 2. Medium Intensity Resistance Training Programme

Exercises	Phase- I (1 to 4 weeks)				Phase- II (5 to 8 weeks)				Phase- III (9 to 12 weeks)			
	Intensity	Repetition	Sets	Rests	Intensity	Repetition	Sets	Rests	Intensity	Repetition	Sets	Rests
Shoulder press	60%	8-10	2	12 min	60%	10-12	2	10 min	60%	12-14	3	8 min
Bench press	60%	8-10	2	12 min	60%	10-12	2	10 min	60%	12-14	3	8 min
Heel raise	60%	8-10	2	12 min	60%	10-12	2	10 min	60%	12-14	3	8 min
Half squat	60%	8-10	2	12 min	60%	10-12	2	10 min	60%	12-14	3	8 min
Arm curl	60%	8-10	2	12 min	60%	10-12	2	10 min	60%	12-14	3	8 min
Bent over row	60%	8-10	2	12 min	60%	10-12	2	10 min	60%	12-14	3	8 min
Military Press	60%	8-10	2	12 min	60%	10-12	2	10 min	60%	12-14	3	8 min
Upright row	60%	8-10	2	12 min	60%	10-12	2	10 min	60%	12-14	3	8 min
Dead lift	60%	8-10	2	12 min	60%	10-12	2	10 min	60%	12-14	3	8 min

Table 3. High Intensity Resistance Training Programme

Exercises	Phase- I (1 to 4 weeks)				Phase- II (5 to 8 weeks)				Phase- III (9 to 12 weeks)			
	Intensity	Repetition	Sets	Rests	Intensity	Repetition	Sets	Rests	Intensity	Repetition	Sets	Rests
Shoulder press	80%	8-10	2	12 min	80%	10-12	2	10 min	80%	12-14	3	8 min
Bench press	80%	8-10	2	12 min	80%	10-12	2	10 min	80%	12-14	3	8 min
Heel raise	80%	8-10	2	12 min	80%	10-12	2	10 min	80%	12-14	3	8 min
Half squat	80%	8-10	2	12 min	80%	10-12	2	10 min	80%	12-14	3	8 min
Arm curl	80%	8-10	2	12 min	80%	10-12	2	10 min	80%	12-14	3	8 min
Bent over row	80%	8-10	2	12 min	80%	10-12	2	10 min	80%	12-14	3	8 min
Military Press	80%	8-10	2	12 min	80%	10-12	2	10 min	80%	12-14	3	8 min
Upright row	80%	8-10	2	12 min	80%	10-12	2	10 min	80%	12-14	3	8 min
Dead lift	80%	8-10	2	12 min	80%	10-12	2	10 min	80%	12-14	3	8 min

Statistical Analyses

The information gathered from the four gatherings before and following the training program on the chose standard factors were factually examined with Analysis of Covariance (ANCOVA). At whatever point the 'F' proportion for changed post test implies was discovered to be critical, Scheffe's test was followed, as a post hoc test to figure out which of the combined mean contrasts was huge. In all the cases .05 degree of certainty was fixed as a degree of certainty to test the speculations.

RESULTS

To examine the significance improvement of speed among LIRTG, MIRTG, HIRTG and CG of selected variables analysis of covariance (ANCOVA) was applied. Whenever the 'F' ratio for adjusted post test means was found to be significant, Scheffe's test was followed as a post hoc test to determine which of the paired means difference was significant.

Table 4. Computation of Analysis of Covariance of Experimental Groups and Control Group on Speed

Test	LIRTG	MIRTG	HIRTG	CG	Source of Variance	Sum of Squares	df	Mean Squares	F ratio
Pre Assessment Mean	7.72	7.73	7.69	7.70	Between	0.02	3	0.01	0.27
					Within	1.20	56	0.02	
Post Assessment Mean	6.65	6.23	7.20	7.64	Between	17.12	3	5.71	87.49*
					Within	3.65	56	0.07	
Adjusted Post Assessment Mean	6.64	6.23	7.21	7.64	Between	17.18	3	5.73	87.99*
					Within	3.58	55	0.07	

* Significant at 0.05 level of confidence
(Speed Scores in 1/100th Seconds)

Table value for $df(3, 56)$ at 0.05 level = 2.76 Table value for $df(3, 55)$ at 0.05 level = 2.78

The table-4 shows that the pre assessment mean values on Speed of LIRTG, MIRTG, HIRTG and CG are 7.72, 7.73, 7.69 and 7.70 respectively. The obtained 'F' ratio of 0.27 for pre assessment scores was lesser than the table value of 2.76 for degrees of freedom 3 and 56 required for significance at 0.05 level of confidence on Speed.

The post assessment mean values on Speed of LIRTG, MIRTG, HIRTG and CG are 6.65, 6.23, 7.20 and 7.64 respectively. The obtained 'F' ratio of 87.49 for post- assessment scores was higher than the table value of 2.76 for degrees of freedom 3 and 56 required for significance at 0.05 level of confidence on Speed.

The adjusted post-assessment means on Speed of LIRTG, MIRTG, HIRTG and CG are 6.64, 6.23, 7.21 and 7.64 respectively. The obtained 'F' ratio of 87.99 for adjusted post-assessment scores was higher than the table value of 2.78 for degrees of freedom 3 and 55 required for significance at 0.05 level of confidence on Speed.

The results of the study indicate that there are significant differences among the adjusted post assessment means of LIRTG, MIRTG, HIRTG and CG in Speed performance.

To determine which of the paired means have a significant difference, the Scheffe's test is applied as Post hoc test and the results are presented in Table 5.

Table 5. The Scheffe's test for the differences between the adjusted post test paired means on Speed

Adjusted Post-test Means				Mean Difference	Confidence Interval
LIRTG	MIRTG	HIRTG	CG		
6.64	6.23			0.42*	0.27
6.64		7.20		0.56*	0.27
6.64			7.64	1.00*	0.27
	6.23	7.20		0.98*	0.27
	6.23		7.64	1.41*	0.27
		7.20	7.64	0.44*	0.27

* Significant at 0.05 level of confidence

The table-5 shows that the adjusted post assessment mean differences on Speed between LIRTG and MIRTG, LIRTG and HIRTG, LIRTG and CG, MIRTG and HIRTG, MIRTG and CG, HIRTG and CG are 0.42, 0.56, 1.00, 0.98, 1.41 and 0.44 respectively, which are greater than the confidence interval value of 0.27 at 0.05 level of confidence.

The results of the study showed that there was a significant difference between LIRTG and MIRTG, LIRTG and HIRTG, LIRTG and CG, MIRTG and HIRTG, MIRTG and CG, HIRTG and CG on Speed.

The above data also reveal that MIRTG had shown better performance LIRTG, HIRTG and CG in Speed.

The pre and post assessment mean values of LIRTG, MIRTG, HIRTG and CG on Speed are graphically represented in the Figure 1.

The adjusted assessment mean values of LIRTG, MIRTG, HIRTG and CG on Speed are graphically represented in the Figure 2.

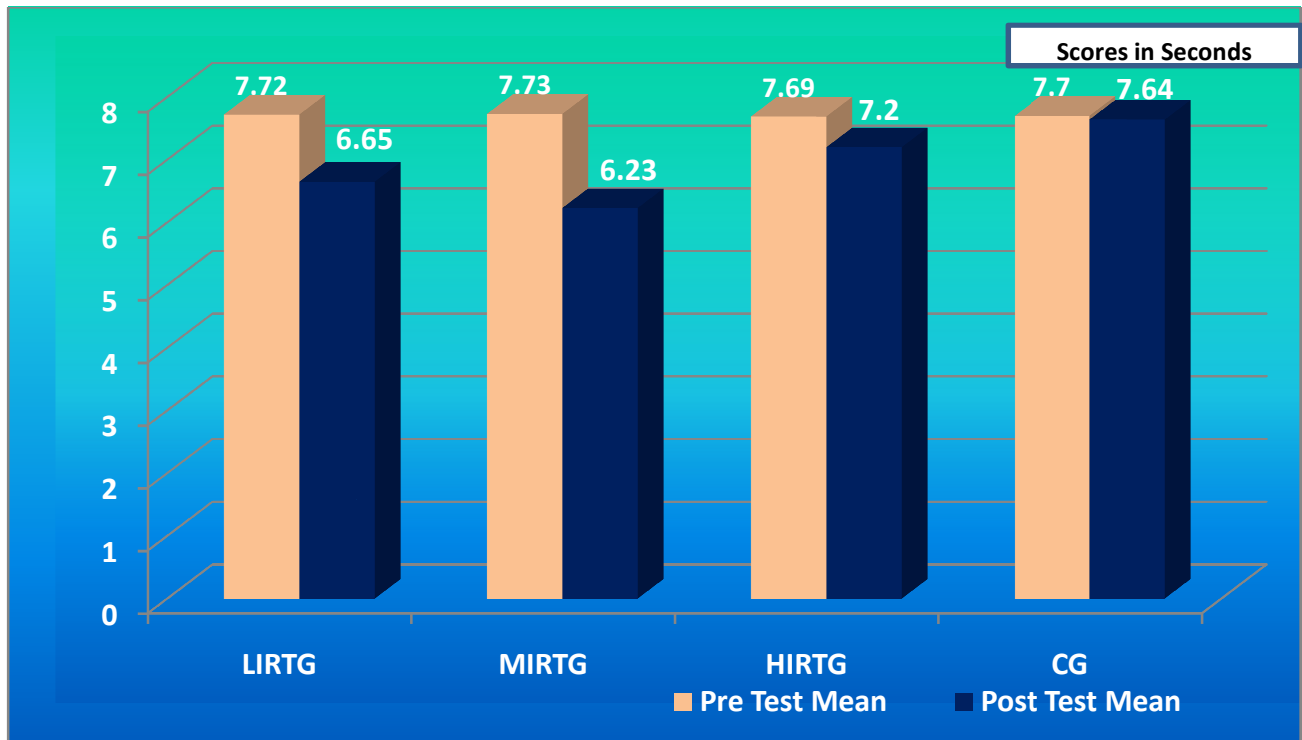


Figure 1. Mean Changes in Speed across time (50M)

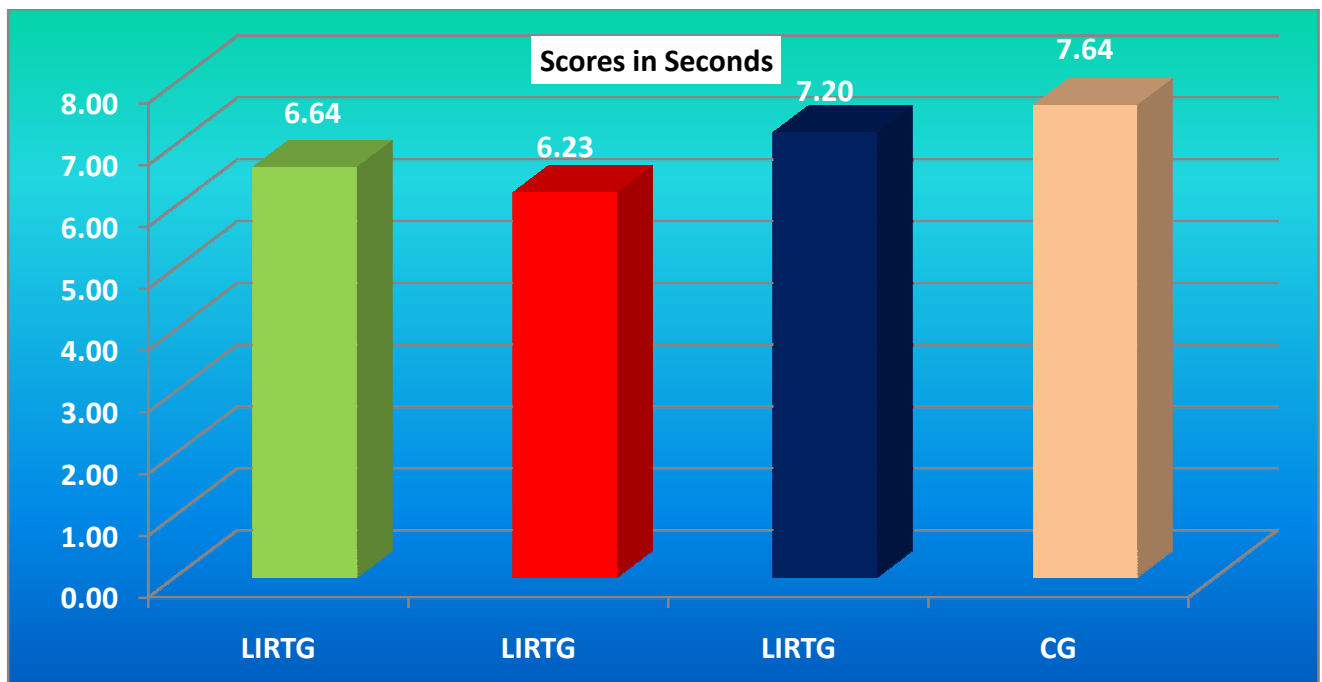


Figure 2. Adjusted Post test Mean Changes in Speed across time (50M)

CONCLUSIONS

The results of the study concluded that LIRTG, MIRTG and HIRTG programme had registered significant improvement on Speed. When the experimental groups were compared with each other, the MIRTG was found to be greater than the LIRTG, HIRTG and CG on the decrease of Speed

REFERENCES

- [1]. Kum Shobha Wali and Dr. Rajkumar P Malipatil(2017), Effect of resistance and agility training on performance of hockey players, *International Journal of Physical Education, Sports and Health*, 4(1): 131-132.
- [2]. American heart association. Strength and Resistance Training Exercise available from [https:// www. heart. org/en/healthy-living/fitness/fitnessbasics/strength-and-resistance-training-exercise](https://www.heart.org/en/healthy-living/fitness/fitnessbasics/strength-and-resistance-training-exercise). Accessed on March-28-2019.
- [3]. Cholewa, J. M., Rossi, F. E., MacDonald, C., Hewins, A., Gallo, S., Micenski, A., ... & Campbell, B. I. (2017). The effects of moderate-versus high-load resistance training on muscle growth, body composition, and performance in collegiate women. *The Journal of Strength & Conditioning Research*.
- [4]. Burgeson, C.R., et al., (2001). "Physical Education and Activity: Results from the School Health Policies and Programs," *Journal of Sch Health*, 71, pp.279-93.
- [5]. James, Murray & Peter V Karpoulch (1983) *Rice of weight training in the U.S.A*, England: Cliff New Jersey.
- [6]. Moore, D. R., Burgomaster, K. A., Schofield, L. M., Gibala, M. J., Sale, D. G., & Phillips, S. M. (2004). Neuromuscular adaptations in human muscle following low intensity resistance training with vascular occlusion. *European journal of applied physiology*, 92(4-5), 399-406.
- [7]. Johnston, A. P., De Lisio, M., & Parise, G. (2007). Resistance training, sarcopenia, and the mitochondrial theory of aging. *Applied physiology, nutrition, and metabolism*, 33(1), 191-199.
- [8]. Alagudurai.T and Dr. P Sivagnanam(2019), Effect of resistance training plyometric training and combined training on speed among kabaddi player, *International Journal of Yogic, Human Movement and Sports Sciences* 4(1): 82-83.
- [9]. Seagrave Loren(1996), "Introduction to Sprinting", *New Studies in Athletics*, 2:3.

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