Journal of Advances and Scholarly Researches in Allied Education
Vol. 19, Issue No. 4, July-2022, ISSN 2230-7540

Effect of Complex Training and Resistance Running Program on 100- Meters Race Performance of Men Sprinters

Ram Narain[1]*, 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 impact of complex training and resistance running program on 100- meters race performance of men sprinters. Total N=60 (sixty) male engineering students age ranging from 18-21 years selected from various branches of Indian Institute of Technology Kanpur, Uttar Pradesh, India. The chosen sprinters were assigned into four subgroups by the equated group design on the bases of 100 meters run result performance. The subgroups namely empirical group – I considered as complex training group [CTG = 15], empirical group –II considered as resistance running program group [RRG =15], empirical group – III combined complex training & resistance running program group [CCR=15] and control [CG=15] group – IV were restricted from taking part any specific coaching program (Under observation). The training period was for a twelve weeks. The data were collected before and after the training by conducting 100 meter 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 that complex training, resistance running program and combined complex training and resistance running program were effective to increase the speed of 100 – meter dash performance of sprinters comparative to control group.***

Keywords – complex, resistance, running and speed

----------X----------

INTRODUCTION

Sprints required both strength and power for optimal performance in sprinting events. Complex training method is used to develop both strength and power in one training session (Mike 2014). Combination of high intensity Strength-based exercise, followed by the use of a plyometrics-based exercise and sports specific movements is called as complex training. Heavy loaded exercises work on nervous system and activated the muscle fibers, immediately followed by plyometric exercises stress the muscle fibers to produce involuntary force by the body will be higher than needed to lift own body weight over the hurdles (Bevan 2003). Lower-body power is beneficial for sprinting. Illustrates a lower-body complex training combination of exercises consisting of a split squat and a jumping lunge. The theory behind complex training is that the stimulus for the plyometric training will be heightened because of increased motor neuron excitability from the load placed on the body before the plyometric movement (Jensen and Ebben 2003).

Speed and acceleration are essential components in 100 meters event. Sprinters want to reduce ground contact time, increase stride length and frequency. Resisted sprint training method such as a weighted vest, sled, parachute used as an overload stimulus include parachute towing, sled towing and weighted vest sprinting. As these devices are being implemented in training programs, optimal loads must be considered to improve the acceleration or maximum velocity phase of sprinting. Therefore various loads and distances may be altered to enhance acceleration or maximum speed (Whitney 2017).

STATEMENT OF THE PROBLEM

The purpose of the study was to analyze "effect of complex training and resistance running program on 100- meters race performance of men sprinters."

HYPOTHESIS

- It was hypothesis that complex training, resistance running program and combined complex training & resistance running program would result in a bigger improvement in 100 meters dash performance of sprinters.
- It is hypothesized that the combined complex training & resistance running program groups

www.ignited.in

would be superior than isolated complex training & resistance running program groups sprinters on improving 100 meters speed.

METHODOLOGY

The purpose of this study was to analyze the impact of complex training and resistance running program on 100- meters race performance of men sprinters. Total N=60 (sixty) male engineering students age ranging from 18-21 years selected from various branches of Indian Institute of Technology Kanpur, Uttar Pradesh, India. The chosen sprinters were assigned into four subgroups by the equated group design on the bases of 100 meters run result performance. The subgroups namely empirical group – I considered as complex training group [CTG = 15], empirical group –II considered as resistance running program group [RRG =15], empirical group – III combined complex training & resistance running program group [CCR=15] and control [CG=15] group – IV were restricted from taking part any specific coaching program (Under observation). The training period was for a twelve weeks. The data were collected before and after the training by conducting 100 meter test. The obtained data's were analyzed by Analysis of Covariance (ANCOVA). The level of significant was fixed at 0.05 levels.

Table I: ANALYSIS OF COVARIANCE FOR 100 - METERS PERFORMANCE ON PRE TEST AND POST TEST DATA OF EXPERIMENTAL GROUPS AND CONTROL GROUPS SPRINTERS (IN SECONDS)

GROUPS	CTG Mean±SD	RRG Mean±SD	CCR Mean±SD	CG Mean±SD	SOV &df	SUM OF SQUARES	MEAN SQUARES	OBTAINED 'F'
Pre Test	14.164 ±0.565	13.998 ±0.596	14.190 ±0.458	14.040 ±0.562	B 3	0.393	0.131	0.435
					W 56	16.839	0.301	
Post Test	13.678 ±0.442	13.205 ±0.458	13.240 ±0.503	14.190 ±0.458	B 3	9.577	3.192	14.683*
					W 56	12.176	0.217	
Adjusted Post	13.657	13.308	13.199	14.231	B 3	10.230	3.410	46.698*
					W 55	4.016	0.073	

Table F-ratio value at 0.05 level of confidence for 3 and 56 (df) =2.77, 3 and 55 (df) =2.77 *Significant

The above table-I shows that there is a significant difference on 100 - meters performance among the four groups such complex training group [CTG], resistance running program group [RRG], combined complex training & resistance running program group [CCR] and control [CG] group sprinters. Since the calculated 'F' value required being significant at 0.05 level for 3, 56 d/f and 3, 55 are 2.77 and 2.77, but the calculated values of 100 - meters performance post and adjusted posttest 'F' values are 14.683 and 46.698 respectively. Which are higher than the tabulated value. Since the obtained 'F' ratio is found significant.

Table 2: LSD POST HOC TEST FOR MEAN DIFFERENCES BETWEEN PAIRED MEAN OF GROUPS ON 100 – METER RACE PERFORMANCE

CTG	RRG	CCR	CG	MD	CI
13.657	13.308	-	-	0.349*	0.273
13.657	-	13.199	-	0.458*	
13.657	-	-	14.231	0.574*	
-	13.308	13.199	-	0.109	
-	13.308	-	14.231	0.923*	
-	-	13.199	14.231	1.032*	

Significant at 0.05 level of confidence

The table II shows the adjusted final mean difference [MD] between complex training group sprinters and resistance running program group sprinters [MD = 0.349], complex training group sprinters and combined complex training and resistance running program group sprinters [MD = 0.458], complex training group sprinters and control group sprinters [MD = 0.514], resistance running program group sprinters and combined resistance running program and complex training group sprinters [MD = 0.109], resistance running program group sprinters and control group sprinters [MD = 0.923], combined complex training and resistance running program group sprinters and control group sprinters [MD = 1.032] . The study found that evident that calculated mean differences values were higher than CI value 0.273. Therefore significant differences found between training.

www.ignited.in

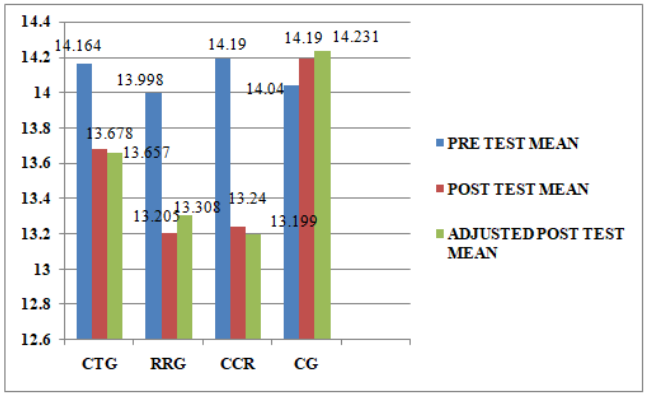

Figure 1: Graphical Illustration Showing the Pre-Test Post-Test and Adjusted Post-Test Mean Values on 100 – Meter Race performance

DISCUSSION ON HYPOTHESIS

- First hypothesized was that complex training, resistance running program and combined complex training & resistance running program would result in a bigger improvement in 100 meters dash performance of sprinters. The statistical analysis proved that isolated and combined training significantly enhanced the 100 – meter race performance of their respective empirical groups. Hence research hypothesis accepted
- Second hypothesized was that the combined complex training & resistance running program groups would be superior than isolated complex training & resistance running program groups sprinters on improving 100 meters speed. Research hypothesized was accepted on the bases of result, it is proved that the combined complex training & resistance running program is superior to isolated complex training & resistance running program to improve the 100 – meters dash performance.

DISCUSSION AND FINDINGS

On the bases of analysis, found that 100 – meters performance of the empirical group's sprinters improved with the impact of isolated and combined training. The studies on 100 – meters performance were Raghavendra (2017) concluded sand running training is effective method for increasing speed of school boys. Katja et al., (2021) reports that resistance sled training is employed as a training tool to improve sprint performance for acceleration and maximal velocity running, lighter loads seem not provoke changes in maximum velocity kinematics, heavy load is possible to train acceleration. Kratky et al., (2016) result indicated that body weight supporting kite specific method causes to reduce ground contact time, whereas stride length and rate remained unchanged between free sprint and body weight supported sprint. Lockie et al., (2012) found that variety of resistance training protocol interventions were effective to increases acceleration velocity, step length, decreases flight time and step frequency.

CONCLUSIONS

Combined complex training and resistance running program is more effective than isolated complex training and resistance running program to increase 100 m run performance speed of the sprinters. Resistance running program is better than complex training to decrease the 100 m run performance time in seconds of sprinters. Finally complex training, resistance running program and combined complex training and resistance running program group were effective to enhance 100 m run performance speed than control group sprinters.

REFERENCES

1. **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.
2. **Bevan HR, Owen NJ, Cunnigham DJ, Kingsley MI, Kilduff LP (2003).** Complex Training in Professional Rugby Players: Influence of Recovery Time on Upper-body Power Output. J Strength Cond Res; 23(6):1780-1785.
3. **Jensen RL and Ebben WP. (2003)** Kinetic analysis of complex training rest interval effect on vertical jump performance. J Strength Cond Res 17: 345–349.
4. **Katja M. Osterwald, David T. Kelly, Thomas M. Comyns and Ciarán Ó Catháin (2021)** Resisted Sled Sprint Kinematics: The Acute effect of load and sporting population, Sports, 9 (137).
5. **Kratky S and Muller E (2013)** "Sprint running with a body-weight supporting kite reduces ground contact time in well-trained sprinters", Journal of Strength and Conditioning Research;27(5):1215-22.
6. **Lockie Robert G, Murphy Aron J, Schultz Adrian B, Knight Timothy J, Janse de Jonge and Xanne A.K. (2012)** The effects of different speed training protocols on sprint acceleration kinematics and muscle strength and power in field sport athletes, Journal of strength and conditioning research, 26(6).
7. **Mike Greenwood (2014)** Complex Training Reexamined: Review and Recommendations to Improve Strength and Power, Strength and Conditioning Journal 36(2):11-19.

8. **Raghavendra.K (2017)** Effect of sand running training on speed among school boys, International Journal of Creative Research Thoughts (IJCRT), 5(4).

9. **Whitney D Leyva, Megan A Wong and Lee E Brown (2017)** Resisted and Assisted Training for Sprint Speed: A Brief Review, Journal of physical fitness, medicine and treatment in sports, 1(1).

Corresponding Author

Ram Narain*

Ph.D Research scholar, University College of Physical Education and Sports sciences, Acharya Nagarjuna University, AP

www.ignited.in