



EFFECT OF CLOSED AND OPEN KINETIC CHAIN WEIGHT TRAINING IN COMBINATION OF PLYOMETRIC TRAINING ON ACCELERATION ABILITY AMONG FEMALE SPRINTERS

1Ms. A.Pranavi and 2Prof. G.Sarah Sarojini

1Research Scholar and 2Professor & Research Guide

1&2Department of Physical Education, SPMVV

Tirupati, Andhra Pradesh, India

Abstract

The Aim of the study was to find out the Effect of Closed and Open Kinetic Chain Weight Training in combination of Plyometric Training on Acceleration Ability among Female Sprinters. The investigator randomly selected 90 athletes (n = 90), who competed at inter collegiate level sports meets. They were divided into three groups with thirty subjects each (n = 30) at random again consisting thirty subjects in each group and they were randomly assigned as experimental group I (CKC + P) and Experimental group II (OKC + P) and control group (CG) and Acceleration Ability has selected as criterion variable of this study. The experimental groups underwent Closed and Open Kinetic Chain Weight Training in combination of Plyometric Training for eight weeks three days per week and a session on each day. The difference between the pre-test and post-test means were subjected to statistical treatment using ANCOVA, in all cases 0.05 level was fixed to test the hypothesis of the study, which was considered as an appropriate. It was concluded from the result of the study that there was a significant improvement (p ≤ 0.05) due to Closed and Open Kinetic Chain Weight Training in Combination of Plyometric Training as compared to Control group.

Keywords: Closed and Open Kinetic Chain,Weight Training,Acceleration Ability, Sprinters.

Introduction

A sport in the present world has become extremely competitive. It is not the mere participation or practice that brings out victory to an individual. Therefore, sports life is affected by various factors like physiology, biomechanics, sports training, sports medicine, sociology and psychology etcetera. All the coaches, trainers, physical educational personals and doctors are doing their best to improve the performance of the players of their country. Athlete players of all the countries are also trying hard to bring laurels, medals for their countries in International competitions.

Athletic performance has dramatically progressed over the past few years. Performance levels unimaginable before are now common place, and the number of athletes capable of outstanding results is increasing. One factor is that athletics is a challenging field, and intense motivation has encouraged long, hard hours of work. Also, coaching has become more sophisticated, partially from the assistance of sport specialists and scientists. A broader base of knowledge about athletes now exists, which is reflected in training methodology (Bompa, 1999). The physical fitness standard is set higher than the health fitness standard and requires a more vigorous exercise program. Whenever possible, participating in a vigorous exercise program is preferable because it provides even greater health and fitness benefits.

Materials and Methods

The Aim of the study was to find out the effect of Closed and Open Kinetic Chain Weight Training in combination of Plyometric Training on Acceleration Ability among Female Sprinters. The investigator randomly selected 90 athletes (n = 90), who competed at inter collegiate level sports meets representing different colleges in Rayalaseema region Andhra Pradesh. Were selected as subjects and the age of students were between 18 and 22 years. The selected subjects were randomly divided into three equal groups of thirty subjects each (n = 30). Experimental group I was assigned as Closed Kinetic Chain Weight Training Plus Plyometric exercises group (CKC + P) and Experimental group II was assigned as Open Kinetic Chain Weight Training Plus Plyometric group (OKC + P) and control group. During the training period, the experimental groups underwent their respective training programme for eight weeks 3 days per week. Control group (CG), who did not participate in any specific training. Acceleration Ability was selected as dependent variable for this study. It was measured through 30mt run test. The collected data were statistically examined by analysis of covariance (ANCOVA). The confidence level was fixed at 0.05 levels, which is appropriate to the present study. Whenever the 'F' ratio is found be significant, Sheffee's test was applied as post hoc test to find out the paired mean differences.

Results on Acceleration Ability

The statistical analysis comparing the initial and final means of Acceleration Ability due to Closed Kinetic Chain Weight Training Plus Plyometric exercises group and Open Kinetic Chain Weight Training Plus Plyometric exercises among Female Sprinters is presented in Table I



Table I

Computation of Analysis of Covariance of Pre – Test and Post Test on Acceleration Ability Scores of Closed Kinetic Chain Weight Training Plus Plyometric Exercises Group and Open Kinetic Chain Weight Training Plus Plyometric Exercises Group and Control Groups

TEST	CKC + P	OKC + P	CONTROL GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARES	OBTAINED F - RATIO
Pre-Test Mean	5.59	5.74	5.69	Between	0.31	2	0.16	1.13
				Within	12.15	87	0.14	
Post Test Mean	5.34	5.41	5.65	Between	1.59	2	0.79554	6.85*
				Within	10.11	87	0.12	
Adjusted Post Test Mean	5.40	5.36	5.64	Between	1.34	2	0.67	18.09*
				Within	3.19	86	0.04	
Mean Diff	-0.26	-0.33	-0.04					

The value of required for significant at 0.05 levels with 2 and 87 (df) = 3.10, 2 and 86 (df). 3.10

*Significant

Pre-Test The obtained pretest means on Acceleration Ability on Closed Kinetic Chain Weight Training Plus Plyometric Exercises group was 5.59, Open Kinetic Chain Weight Training Plus Plyometric exercises group was 5.74 was and Control group was 5.69. The obtained pretest F value was 0.01 and the required table F value was 1.13, which proved that there was no significant difference among initial scores of the subjects.

Post – Test The obtained posttest means on Acceleration Ability on Closed Kinetic Chain Weight Training Plus Plyometric Exercises group was 5.34, Open Kinetic Chain Weight Training Plus Plyometric exercises group was 5.41 was and Control group was 5.65. The obtained posttest F value was 6.85 and the required table F value was 3.10, which proved that there was significant difference among post test scores of the subjects.

Adjusted Post - Test Taking into consideration of the pretest means and posttest means adjusted posttest means were determined and analysis of covariance was done and the obtained F value 18.09 was greater than the required value of 3.10 and hence it was accepted that there was significant differences among the treated groups.

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

Table II

Multiple Comparisons of Paired Adjusted Means and Scheffe’s Post Hoc Confidence Interval Test Results on Acceleration Ability

MEANS				Confidence Interval
CKC + P	OKC + P	CONTROL GROUP	Mean Difference	
5.40	5.36		0.04	0.12
5.40		5.64	0.24*	0.12
	5.36	5.64	0.28*	0.12

* Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between Closed Kinetic Chain Weight Training Plus Plyometric Exercises group and control group (MD: 0.24*). There was significant difference between Open Kinetic Chain Weight Training Plus Plyometric exercises group and control group (MD: 0.28*). There was significant difference between treatment groups, namely, Closed Kinetic Chain Weight Training Plus Plyometric Exercises group and Open Kinetic Chain Weight Training Plus Plyometric exercises group. (MD: 0.04).



Conclusion

Both Closed Kinetic Chain weight training cum Plyometric training and Open Kinetic Chain Weight training cum Plyometric training of the study causes significant improvement in Acceleration Ability of sprinters. In terms of absolute mean difference, the Closed Kinetic Chain Weight Training Plus Plyometric Exercises group showed better improvement in Acceleration Ability after the experimentation period when compared to the Open Kinetic Chain Weight Training Plus Plyometric exercises group of the study.

References

- Harries Sk et.al (2012), Resistance training to improve power and sports performance in adolescent athletes: a systematic review and meta-analysis. *J Sci Med Sport*. Nov;15(6):532-40.
- Hrysomallis C (2012), The effectiveness of resisted movement training on sprinting and jumping performance. *J Strength Cond Res*. Jan;26(1):299-306.
- Cherif M, Said M et.al. (2012), The effect of a combined high-intensity plyometric and speed training program on the running and jumping ability of male handball players. *Asian J Sports Med*. Mar;3(1):21-8.
- A.D., Milliken L.A. Westcott W.L. (2003). "Maximal Strength Testing in Healthy Children", *Journal of Strength and Conditioning Research*, 17 (1), 162-66.
- Balabins, C.P. Psaratis, C.N., Moukasm, Vasilion M.P. and Behrakis P.K., (2003) "Early Phase Changes by Concurrent Endurance and Strength Training", *Journal of Strength and Conditioning Research*, 2, 293-401.
- Benito-Martinez E, Martinex-Amat A et.al. (2013), Effect of combined electrostimulation and plyometric training on 30 meters dash and triple jump. *J Sports Med Phys Fitness*. Aug;53(4):387-95.
- Brain Mackenzie (2004). "Seven Step Model to Develop Speed", *Journal of Medicine and Science in Sports*
- Fernández-García, (2000), "Intensity of exercise during road race pro-cycling competition." *Med. Sci. Sports. Exerc*. May; 32(5):1002-6
- Hrusomallis C. 2012, The effectiveness of resisted movement training on sprinting and jumping performance. *J Strength Cond Res*. 26(1): 299-306.
- Lopez-Segovia M, Marques MC et.al. 2011, Relationships between vertical jump and full squat power outputs with sprint times in u21 soccer players. *J Hum Kinet*. 30: 135-44.
- Meylan CM, Cronin J et.al. 2014. Contribution of vertical strength and power to sprint performance in young male athletes. *Int J Sports Med*. 35(9): 749-54.
- Prokopy MP, Ingersoll CD, Nordenschild E et.al. 2008, Closed-kinetic chain upper-body training improves throwing performance of NCAA Division I softball players. *J Strength Cond Res*. 22(6): 1790-98.
- Ramirez-Campillo R, Burgos C, Henriquez-Olguin C, Andrade DC et.al. 2014, Effect of unilateral, bilateral and combined plyometric training on explosive and endurance performance of young soccer players. *J Strength cond Res*. 2014, Dec 2 (Epub ahead of print)

Filename: 12
Directory: C:\Users\DELL\Documents
Template: C:\Users\DELL\AppData\Roaming\Microsoft\Templates\Normal.dotm
Title:
Subject:
Author: Windows User
Keywords:
Comments:
Creation Date: 4/16/2021 4:41:00 PM
Change Number: 6
Last Saved On: 4/29/2021 8:12:00 PM
Last Saved By: Windows User
Total Editing Time: 14 Minutes
Last Printed On: 4/29/2021 8:13:00 PM
As of Last Complete Printing
Number of Pages: 3
Number of Words: 1,590 (approx.)
Number of Characters: 9,065 (approx.)