Impact of Plyometric training Programme on Selected Physical Fitness Variables among Inter-Collegiate Women Basketball Players

* Mrs.S.Joicsy, Director of Physical Education, Sri Ramakrishna College of Arts & Science for Women, Coimbatore, Tamil Nadu. India

** Dr.M.Jayachitra, (Research Guide) Director of Physical Education, PSGR Krishnammal College for Women, Coimbatore, Tamil Nadu. India

Abstract

The modern history of Plyometric is somewhat brief but not relatively new. Plyometric are training techniques used by athletes in all types of sports to increase strength and explosiveness **(Clutch, 1983)**. This technique was created by Yuri Verhoshansky, a Russian coach,in the Soviet Union, who could very well be called the "Father of Plyometric" and this plyometric was originally known as “shock training” **(Kutz, 2003)**. Fred Wilt, a U.S. track and field coach, is credited with coining the term “plyometric”, meaning “measurable increases”.The word "plyometric" consists of two parts:"plio" meaning "more"; and "metric" meaning "measure" **(Cheatham, 2006)**. Plyometric training was Plyometric consists of a rapid stretching of a muscle (eccentric action) immediately followed by a concentric or shortening action of the same muscle and connective tissue **(Baechle, 2007)**. This training involves with a jumping movement such as skipping, bounding, jumping rope, hopping, lunges, jump squats, and clap push-ups. A plyometric contraction involves three consecutive phases such as Eccentric Phase - a rapid muscle lengthening movement, Amortization Phase - a short resting phase and Concentric Phase - an explosive muscle shortening movement. **(Brown, 2007)** The purpose of the present study was to determine the impact of plyometric training programme on selected physical fitness variables among inter- collegiate women basketball players. To achieve the purpose of this present study, forty (N=40) basketball players were selected from Sri Ramakrishna College of Arts& Science for Women, Coimbatore, Tamil Nadu, India. The subjects were randomly selected and their aged 18-25 years. The selected groups were divided into two equal groups, namely experimental and control group. The experimental group exposed to the plyometric training and the control group were not having any specific training. The duration of the training period was restricted to six weeks and the session for six days in a week. Plyometric training program is considered as the independent variables. The physical fitness variables such as leg explosive power and flexibility known as dependent variables. The subjects of the two groups were tested on selected variables prior and immediately after the period . The collected data was analysed statistically through Paired Sample t test to find out significance difference with 0.05 level of confidence. The results showed that the plyometric training group had significant improvement ($P \leq 0.05$) in the level of the selected criterion physical fitness variables such as leg explosive power and flexibility than the control group. This study indicated that the plyometric training were significantly improved the performance of selected physical fitness variables among the selected women basketball players.

Keywords: Plyometric Training, Leg explosive power and Flexibility.

Introduction

The modern history of Plyometric is somewhat brief but not relatively new. Plyometric are training techniques used by athletes in all types of sports to increase strength and explosiveness **(Clutch, 1983)**. This technique was created by Yuri Verhoshansky, a Russian coach,in the Soviet Union, who could very well be called the "Father of Plyometric" and this plyometric was originally

known as “shock training” **(Kutz, 2003)**. Fred Wilt, a U.S. track and field coach, is credited with coining the term “plyometric”, meaning “measurable increases”.The word "plyometric" consists of two parts:"plio" meaning "more"; and "metric" meaning "measure" **(Cheatham, 2006)**. Plyometric training was Plyometric consists of a rapid stretching of a muscle (eccentric action) immediately followed by a concentric or shortening action of the same muscle and connective tissue **(Baechle, 2007)**. This training involves with a jumping movement such as skipping, bounding, jumping rope, hopping, lunges, jump squats, and clap push-ups. A plyometric contraction involves three consecutive phases such as Eccentric Phase - a rapid muscle lengthening movement, Amortization Phase - a short resting phase and Concentric Phase - an explosive muscle shortening movement. **(Brown, 2007)**

Methodology

The purpose of the investigation was to find out the Impact of Plyometric training Programme on Selected Physical Fitness Variables among Inter-Collegiate Women Basketball Players.Forty (N=40) basketball players were selected from Sri Ramakrishna College of Arts& Science for Women, Coimbatore, Tamil Nadu, India. The subjects were randomly selected and their aged 18-25 years.

Training Programme

The subjects were told every thing about the test. The training programmed for the group was to underwent plyometric training for six days . The selected plyometric training to improve the flexibility and leg explosive power. Plyometric training was given in the morning and evening time respectively for a period of 45 minutes on both session.

Statistical Techniques

The data collected from the experimental group on selected variables on flexibility and leg explosive power was statistically examined using the ‘t’ ratio. The level of significant was fixed at 0.05 level of confidence.

Results and Discussion

The analysis of the data pertaining to the study has been presented in this chapter Forty (N=40) basketball players were selected from Sri Ramakrishna College of Arts& Science for Women, Coimbatore, Tamil Nadu, India. The subjects were randomly selected and their aged 18-25 years were taken. The data was collected initially and after the training from the experimental group on the selected variables. Analysis of variance followed by analysis of “t” test was employed, to find out if any significant differences existed on the selected variables the experimental group. Sophisticated instruments were not much in this study for obtaining the data. The level of significance was fixed at 0.05 level of confidence which was considered adequate for the purpose of this study. The mean performance of flexibility and leg explosive power before and after the experimental period is graphically presented. The data were analyzed statistically by compiling analysis of “t” for all the variables. The obtained “t” ratios were tested for significance at 0.05 level f confidences. Significant differences at level of confidence were seen in all the variables such as flexibility and leg explosive power in favour of experimental group.

TABLE –I
COMPUTATION OF 't' VALUE BETWEEN PRE-TEST AND POST-TEST MEANS OF PLYOMETRIC TRAINING GROUP AND CONTROL GROUP ON LEG EXPLOSIVE POWER

Group	Tests	Means	MD	Standard Error Means	't' Value
PlyometricTraining Group	Pre-test	30.65 ±3.07	15.20	0.77	19.66*
	Post-test	45.85 ±1.31			
Control Group	Pre-test	32.50 ±3.33	0.45	0.34	1.34
	Post-test	32.49 ±3.28			

*Significant at 0.05 level for the degrees of freedom 1 and 14 table Value of 2.09

Table –1 data shows that 't' value on leg explosive power of plyometric training Group was 19.66 and it was higher than the required table value of 2.09. It was found to be statistically significant at 0.05 level of confidence for the degrees of freedom 1 and 19. Further, the obtained 't' value of 1.34 between pre-test and post-test of Control Group was lesser than the required table value of 2.09 and hence found to be statistically insignificant difference. From the result, it was inferred that plyometric Training Group produced significant improvement in the leg explosive power of basketball players.

FIGURE -I

BAR DIAGRAM SHOWING THAT THE PRE-TEST AND POST-TEST MEANS OF PLYOMETRIC TRAINING GROUP AND CONTROL GROUP ON LEG EXPLOSIVE POWER

TABLE –II

COMPUTATION OF 't' VALUE BETWEEN PRE-TEST AND POST-TEST MEANS OF PLYOMETRIC TRAINING GROUP AND CONTROL GROUP ON FLEXIBILITY

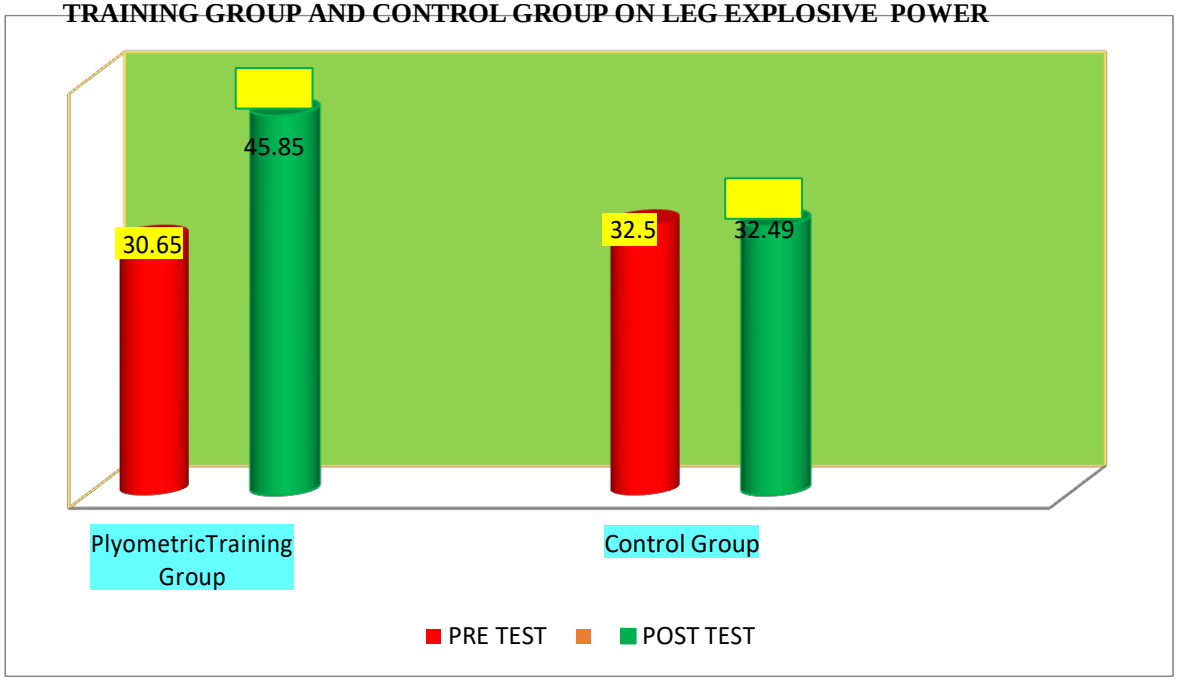
Group	Tests	Means	MD	Standard Error Means	't' Value
Plyometric Training Group	Pre-test	29.65 ±1.60	4.50	0.48	9.40*
	Post-test	34.15 ±2.32			
Control Group	Pre-test	29.70 ±1.92	0.35	0.35	1.00
	Post-test	30.05			

		±1.73			

*Significant at 0.05 level for the degrees of freedom 1 and 14 table value of 2.09

FIGURE -II

BAR DIAGRAM SHOWING THAT THE PRE-TEST AND POST-TEST MEANS OF PLYOMETRIC TRAINING GROUP AND CONTROL GROUP ON LEG EXPLOSIVE POWER



Discussion on the Findings

The results of the study indicate that the plyometric training were significantly improved the performance such as on selected physical fitness variables such as leg explosive power and flexibility it may be due to the nature of the plyometric training which have influenced to increase the performance of basketball players. The results of the study indicate that there is a significant improvement on as leg explosive power and flexibility of the plyometric training group when compared to the control group. This study is supported by Booth mark et al. (2016) who found acquisition of plyometric training are important predictor of skill acquisition. The findings were further in agreement with the findings of Karim Chamari and Bianca Miarka (2016) who found

perceptual training group (PTG) and perceptual training physical fitness variables such as leg explosive power and flexibility training group had shown significant improvement in ($P<0.05$) the selected plyometric training and physical variables.

Conclusions

From the analysis of the data, the following conclusions were drawn.

1. The experimental group namely plyometric training group had achieved significant improvement on selected physical fitness variables such as leg explosive power and flexibility.
2. The control group had no shown significant changes in any of the selected variables.
3. The selected inter-collegiate women basketball players shown significant different in all the selected variables due to the six weeks of plyometric Training.

The findings of this study proved that Physical variables, such as leg explosive power and flexibility significantly improved through plyometric training among inter-collegiate basketball players,which was in agreement with the previous researches. In the light of the above findings, the investigator recommends this training for basketball women team to improve their performance on the court.

References

1. A.A.A.Hasan1, J.A.Rahaman1, N.T.Cable, T.Reilly (2007) *anthropometric profile of elite male basketball players in Asia.Exercise Physiology and Sport Science, University of Kuwait,Kuwait Biology of Sport, Vol. 24 No1.*
2. Abdel Mohsen Zakaria Ahmed and Dalia Mohamed Saied Hashem (2011) *Effect of using Fartlek exercises on some physical and physiological variables of football and Volleyball players World journal of sport sciences,Issn 2078-4724.*
3. Ajmer Singh et al (2005) *definition on physiology Essentials of PhysicalEducation, p. 306*
4. Aman deep Singh,Visha Gaurav*(2014) study of physical characteristics of Indian basketball Players at different level of competition.Turkish journal park academy ISSN: 2147-5652*
5. Booth, Mark A, Orr, Rhonda (2016) *Effects of Plyometric Training On Sports Performance. Strength & Conditioning Journal doi:10.1519/SSC.0000000000000183*
6. Baechle, T.R. and Earle, R.W. (2000) *Essentials of strength training and conditioning. 2nd edition. Champaign, IL: National Strength and Conditioning Association.*
7. Brown, Andrea C.; Wells, Tobin J.; Schade, Margaret L.; Smith, Denise L.; Fehling, Patricia C., (2007) *"Effects of Plyometric Training Versus Traditional Weight Training on Strength, Power, and Aesthetic Jumping Ability in Female Collegiate Dancers," Journal of Dance Medicine & Science, 11, 2,38-44(7).*
8. ChetnaChaudhary and BirendraJhajharia, (2010) *"Effects of plyometric exercises on selected motor abilities of university level female basketball players," British Journal of Sports Medicine, 44: 23.*
9. Clutch, D., Wilton, M., McGowan, C., & Bryce, G.R. (1983*). "The effect of depth jumps and weight training on leg strength and vertical jump".Res.Q. 54, 5–10.*

10. Cheatham and Timothy J. Michael, (2006) *"The effects of a 6 week plyometric training on agility", Journal of Sports Science and Medicine, 5, 459-465.*
11. Kutz, M. (2003). *"Theoretical and practical issues for plyometric training.NSCA's Performance" Training Journal. 2(2): 10-12.*
12. Patrick Hunt. (2016). *"Basketball". Tutorial Point Simply Easy to Learning, 3-4.*