

**SEARCH THIS SITE**

**ANNOUNCEMENT**

you for your intellectual contribution ...

**CATEGORIES**

- + Current Issue
- + Special Issue
- + Past Issues
- + Contact Us
- + Instructions to Authors
- + Author Guidelines
- + Copy right
- + Publication Charges
- + Award winners
- + Disclaimer

**IMPACT FACTOR**



**QR CODE**



**Welcome to IJRRAS**

International Journal of Recent Research and Applied Studies (IJRRAS) is an international, open-access monthly online Refereed journal that accepts research works from scholars, academicians, professors, doctorates, lecturers and corporate in their respective expertise of studies. The aim of IJRRAS is to publish peer reviewed research and review articles fastly without delay. The mission of this journal is to publish original contributions in its field to promote research in various disciplines. IJRRAS aims to bring pure academic research and more practical publications.

So it covers the full range of research applied to various sciences that meet the future demands. All submitted articles should report original, previously unpublished (experimental or theoretical) research and results. All the submissions in the scope of IJRRAS will be peer-reviewed. All submission are also checked for plagiarism.

**CONTACT US**

Editor-In-Chief

**Dr. M. Suresh Kumar**

International Journal of Recent Research and Applied Studies (IJRRAS)

5/65, PG Nagar, Jagir Ammapalayam

Salem - 636 302

Tamil Nadu, India

E-Mail: editor@ijrras@gmail.com, surhoc139@gmail.com

Ph.No. : 09894813609

**JOURNAL INDEXING**



**SUBJECT AREA**

Engineering & Physical Sciences

- + Physics
- + Kinetics
- + Mechanics
- + Electromagnetics
- + Thermodynamics
- + Aerodynamics
- + Chemistry
- + Inorganic Chemistry
- + Electrochemistry
- + Analytical Chemistry
- + Geology
- + Meteorology
- + Astronomy
- + Mathematics
- + Statistics
- + Engineering
- + Computer Science

Life Sciences

- + Genetics
- + Biology
- + Botany
- + Zoology
- + Microbiology

Social Science and Humanities

- + Business
- + Management
- + Economics
- + Education
- + Physical Education
- + Political Science
- + Psychology
- + Sociology
- + Finance
- + Linguistics
- + Social Sciences

Health Science

- + Dermatology
- + Dentistry
- + Pharmacology and Toxicology
- + Endocrinology
- + Immunology



SEARCH THIS SITE

ANNOUNCEMENT



2015 VOLUME 2 ISSUE 3

SUBJECT AREA

[Engineering & Physical Sciences](#)

- Physics
- Kinetics
- Mechanics
- Electromagnetics
- Thermodynamics
- Aerodynamics
- Chemistry
- Inorganic Chemistry
- Electrochemistry
- Analytical Chemistry
- Geology
- Meteorology
- Astronomy
- Mathematics
- Statistics
- Engineering
- Computer Science

[Life Sciences](#)

- Genetics
- Biology
- Botany
- Zoology
- Microbiology

[Social Science and Humanities](#)

- Business
- Management
- Economics
- Education
- Physical Education
- Political Science
- Psychology
- Sociology
- Finance
- Linguistics
- Social Sciences

[Health Science](#)

- Dermatology
- Dentistry
- Pharmacology
- Toxicology
- Endocrinology
- Immunology
- Veterinary Medicine
- Nursing

CERTIFICATE

CATEGORIES

- [Current Issue](#)
- [Special Issue](#)
- [Past Issue](#)
- [Contact us](#)
- [Instructions to Authors](#)
- [Author Guidelines](#)
- [Copy rights](#)
- [Publication Charges](#)
- [Award winners](#)
- [Disclaimer](#)

IMPACT FACTOR



QR CODE



CURRENT ISSUE



PAST ISSUE

S.No	Title / Authors	Download
1	Effect of Varied Frequency and Duration Aerobic Training on Selected Physiological Variables of Handball Players <b>Deeva.E, Dr.S. Nagarajan</b>	
2	Effect of Yogic Practices on Vital Capacity and Body Fat among School Girls <b>Dr. P. Senthikumar</b>	
3	Correlations of Selected Physical Variables with Playing Ability among College Level Soccer Players <b>A. Prem Edwin, Dr. C. Ramesh</b>	
4	Analysis of Selected Quality of Life Variables of Coaches from Various Organizations Working in Tamilnadu State <b>P. Rajan &amp; Dr. S. Prem Kumar</b>	
5	Protein Adequacy of Mid Day Meal on Portion Consumption by 5-6 Year Olds of Delhi Government School <b>Lalita Verma, Dr. Anupa Siddhu</b>	
6	Research Productivity of Indian Space Research Organisation (ISRO): A Bibliometric Analysis <b>R. Duraipandi, Dr.R.Balasubramani</b>	
7	Comparative Analysis of Physical Variables among the Southern State Junior Women Hockey Players <b>N.Mallesh &amp; Dr.R.Gandhi</b>	
8	Effect of Plyometric Training and Ladder Training on Selected Physical Variables among Kho-Kho Players <b>Akash Khatri &amp; Dr.V.Vallimurugan</b>	
9	Effects of High Intensity Aerobic Interval Training Concurrent Low Intensity Aerobic and Resistance Interval Training on Physiological Variables of College Level Football Players <b>K.Giridharan &amp; Dr.Ch. VST. Saikumar</b>	
10	Effects of Aerobic and Anaerobic Training Followed by Cessation on Diastolic Blood Pressure of Anna University Men Players	





## Effect of Plyometric and Functional Core Training on Selected Body Composition among Basketball Players

Siby Lukose<sup>1</sup> & Dr.P.K.Senthilkumar<sup>2</sup>

<sup>1</sup>Ph.D Scholar (Part Time), Department of Physical Education, Tamilnadu Physical Education and Sports University, Chennai, Tamil Nadu, India.

<sup>2</sup>Assistant Professor, Department of Exercise Physiology, Tamilnadu Physical Education and Sports University, Chennai, Tamil Nadu, India.

Received 25th January 2015, Accepted 22nd March 2015

### Abstract

The purpose of the study was to find out the effect of plyometric and functional core training on selected body composition among basketball players. To achieve the purpose of the present study, forty five men basketball players from Ernakulam district, Kerala state, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects were divided into three equal groups of fifteen subjects each. The subjects (N=45) were randomly assigned to three equal groups of fifteen subjects each. Pre test was conducted for all the subjects on selected body composition variables. This initial test scores formed as pre test scores of the subjects. The groups were assigned as Experimental Group I, Experimental Group II and Control Group in an equivalent manner. Experimental Group I was exposed to plyometric training, Experimental Group II was exposed to functional core training and Control Group was not exposed to any experimental training other than their regular daily activities. The duration of experimental period was 12 weeks. After the experimental treatment, all the forty five subjects were tested on their body composition variables. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to statistical analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant, scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses. The plyometric training had decreased BMI and percent body fat than the control group. The functional core training had decreased BMI and percent body fat than the control group.

**Keywords:** Plyometric, Core Training, BMI, Percent Body Fat, Basketball.

© Copy Right, IJRRAS, 2015. All Rights Reserved.

### Introduction

Basketball is one of the sports characterized by many of the basic and variable skills. One of the most important components of basketball is the ability to jump vertically. It is necessary to assess an athlete jumping ability and strength levels before beginning the design of the training program. Nature is such that if plyometric exercises are performed with maximum effort, the muscle can increase the opinion of many exercise physiologists, neural adaptations - the explosive power that affects muscles in 2 to 4 weeks you first start training occurs. Plyometric and weight training 3 times a week will run only when sufficient recovery time between training sessions exist. Plyometrics training is one such training strategy to improve the performance of the basketball players as the training approximates their basic needs of agility and power; allows the muscle to reach exponential increase in the maximum strength and speed of movement in the shortest duration. The training typically involves stretch-shortening cycle of muscle groups and those movements consist of eccentric,

amortization and concentric phases. The shorter the duration of all three phases and more specifically the amortization phase, greater will be the development of exploratory power of the muscles being exercised (Donald, 1998). Functional training is a classification of exercise which involves training the body for the activities performed in daily life. Functional training has its origins in rehabilitation. Functional training attempts to adapt or develop exercises which allow individuals to perform the activities of daily life more easily and without injuries. In the context of body building, functional training involves mainly weight bearing activities targeted at core muscles of the abdomen and lower back (Cannone, 2007).

### Methodology

The purpose of the study was to find out the effect of plyometric and functional core training on selected body composition among basketball players. To achieve the purpose of the present study, forty five men basketball players from Ernakulam district, Kerala state, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects were divided into three equal groups of fifteen subjects each. The subjects (N=45) were randomly assigned to three equal

### Correspondence

Siby Lukose,

E-mail: sibylukose@live.in, Ph: +9199955 55644

groups of fifteen subjects each. Pre test was conducted for all the subjects on selected body composition variables. This initial test scores formed as pre test scores of the subjects. The groups were assigned as Experimental Group I, Experimental Group II and Control Group in an equivalent manner. Experimental Group I was exposed to plyometric training, Experimental Group II was exposed to functional core training and Control Group was not exposed to any experimental training other than their regular daily activities. The duration of experimental period was 12 weeks. After the experimental treatment, all the forty five subjects were tested on their body composition variables.

This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to statistical analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the ‘F’ ratio for adjusted test was found to be significant, scheffe’s post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses.

**Results and Discussion**

The detailed procedure of analysis of data and interpretation were given below,

**Table I.** Computation of analysis of covariance of mean of plyometric and functional core training and control groups on BMI

	<b>Plyometric Training</b>	<b>Functional Core Training</b>	<b>Control Group</b>	<b>Source of Variance</b>	<b>Sum of Squares</b>	<b>df</b>	<b>Means Squares</b>	<b>F-ratio</b>
<b>Pre-Test Means</b>	24.80	24.91	24.24	<b>BG</b>	3.84	2	1.92	1.23
				<b>WG</b>	65.64	42	1.56	
<b>Post-Test Means</b>	22.26	22.11	24.14	<b>BG</b>	38.57	2	19.28	12.55*
				<b>WG</b>	64.53	42	1.53	
<b>Adjusted Post-Test Means</b>	22.19	22.00	24.31	<b>BG</b>	46.33	2	23.16	17.65*
				<b>WG</b>	53.78	41	1.31	

An examination of table - I indicated that the pre test means of plyometric, functional core training and control groups were 24.80, 24.91 and 24.24 respectively. The obtained F-ratio for the pre-test was 1.23 and the table F-ratio was 3.22. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that there were no significant difference between the experimental and control groups indicating that the process of randomization of the groups was perfect while assigning the subjects to groups. The post-test means of plyometric, functional core training and control groups were 22.26, 22.11 and 24.31 respectively. The obtained F-ratio for the post-test was 12.55 and the table F-ratio was 3.22. Hence the post-test mean F-ratio was

significant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that the differences between the post test means of the subjects were significant. The adjusted post-test means of plyometric, functional core training and control groups were 22.19, 22.00 and 24.31 respectively. The obtained F-ratio for the adjusted post-test means was 17.65 and the table F-ratio was 3.23. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. This proved that there was a significant difference among the means due to the experimental trainings on BMI. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe’s post hoc test. The results were presented in Table –II.

**Table II.** The scheffe’s test for the differences between the adjusted post test paired means on BMI

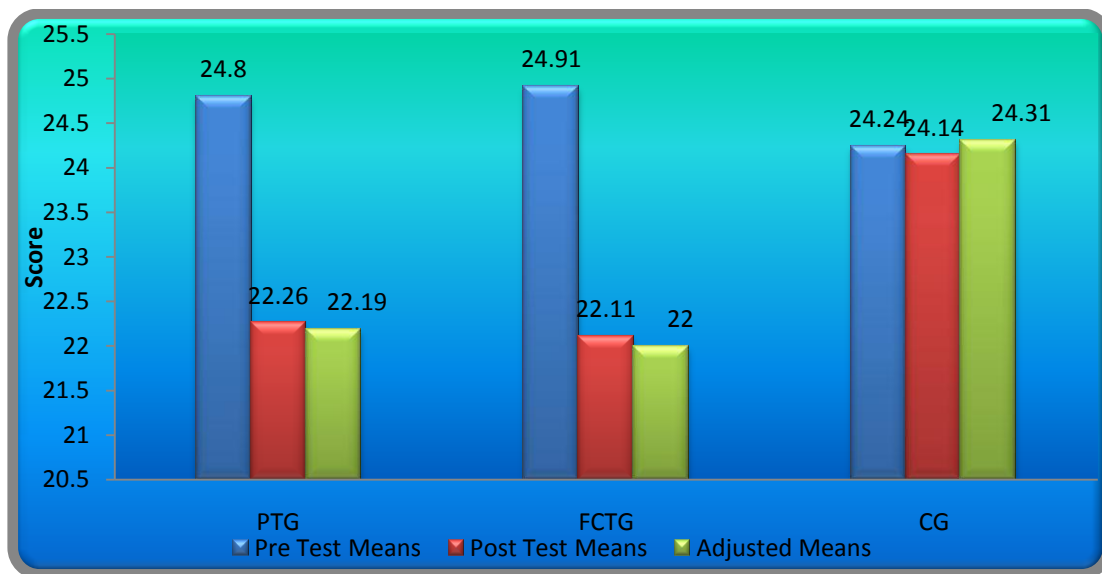
<b>Adjusted Post-test means</b>			<b>Mean Difference</b>	<b>Required CI</b>
<b>Plyometric Training</b>	<b>Functional Core Training</b>	<b>Control Group</b>		
22.19	22.00	---	0.19	1.06
22.19	---	24.31	2.12*	
---	22.00	24.31	2.31*	

*\* Significant at 0.05 level of confidence*

The multiple comparisons showed in Table II proved that there existed significant differences between the adjusted means of plyometric training with control group (2.12), functional core training with control group (2.31). There was no significant difference between

plyometric training and functional core training (0.19) at 0.05 level of confidence with the confidence interval value of 1.06. The pre, post and adjusted means on BMI were presented through bar diagram for better understanding of the results of this study in Figure-I.

**Figure I.** Pre post and adjusted post test differences of the, plyometric training, functional core training and control groups on BMI



**Table III.** Computation of analysis of covariance of mean of plyometric and functional core training and control groups on percent body fat

	Plyometric Training	Functional Core Training	Control Group	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	18.01	18.43	18.39	BG	1.66	2	0.83	1.13
				WG	30.65	42	0.73	
Post-Test Means	16.13	15.11	18.03	BG	65.81	2	32.90	16.68*
				WG	82.82	42	1.97	
Adjusted Post-Test Means	16.23	15.06	17.99	BG	65.42	2	32.71	17.09*
				WG	78.43	41	1.91	

An examination of table - III indicated that the pre test means of plyometric, functional core training and control groups were 18.01, 18.43 and 18.39 respectively. The obtained F-ratio for the pre-test was 1.13 and the table F-ratio was 3.22. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that there were no significant difference between the experimental and control groups indicating that the process of randomization of the groups was perfect while assigning the subjects to groups. The post-test means of plyometric, functional core training and control groups were 16.13, 15.11 and 18.03 respectively. The obtained F-ratio for the post-test was 16.68 and the table F-ratio was 3.22. Hence the post-test mean F-ratio was

significant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that the differences between the post test means of the subjects were significant. The adjusted post-test means of plyometric, functional core training and control groups were 16.23, 15.06 and 17.99 respectively. The obtained F-ratio for the adjusted post-test means was 17.09 and the table F-ratio was 3.23. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. This proved that there was a significant difference among the means due to the experimental trainings on percent body fat. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe’s post hoc test. The results were presented in Table-IV.

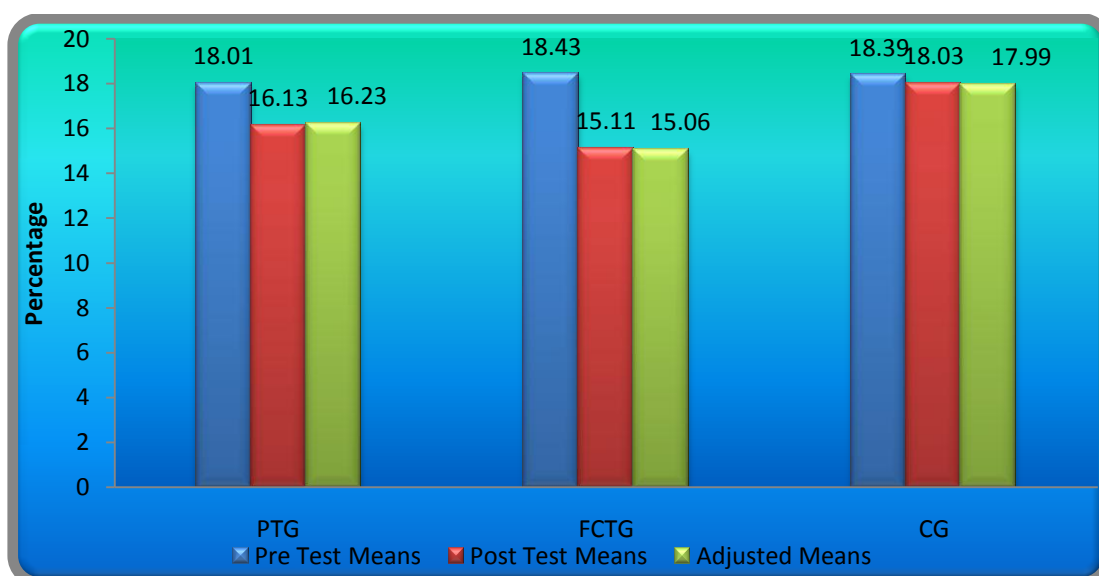
**Table IV.** The scheffe's test for the differences between the adjusted post test paired means on percent body fat

Adjusted Post-test means			Mean Difference	Required CI
Plyometric Training	Functional Core Training	Control Group		
16.23	15.06	---	1.17	1.28
16.23	---	17.99	1.76*	
---	15.06	17.99	2.93*	

\* Significant at 0.05 level of confidence

The multiple comparisons showed in Table IV proved that there existed significant differences between the adjusted means of plyometric training with control group (1.76), functional core training with control group (2.93). There was no significant difference between plyometric training and functional core training (1.17) at

0.05 level of confidence with the confidence interval value of 1.28. The pre, post and adjusted means on percent body fat were presented through bar diagram for better understanding of the results of this study in Figure-II.

**Figure II.** Pre post and adjusted post test differences of the, plyometric training, functional core training and control groups on percent body fat

## Conclusions

In the light of the study undertaken with certain limitations imposed by the experimental conditions, the following conclusions were drawn.

1. The plyometric training had decreased BMI and percent body fat than the control group.
2. The functional core training had decreased BMI and percent body fat than the control group.

## References

1. Ahmed, T. (2013). The effect of upper extremity fatigue on grip strength and passing accuracy in junior basketball players. *J Hum Kinet.* 5;37:71-9.
2. Alejandro, V., Santiago, S., Gerardo, V.J., Carlos, M.J. & Vicente, G.T. (2015). Anthropometric Characteristics of Spanish Professional Basketball Players. *J Hum Kinet.* 10;46:99-106.
3. Arias, J.L. (2012). Performance as a function of shooting style in basketball players under 11 years of age. *Percept Mot Skills.* 114(2):446-56.
4. Barrow, H. M. & McGee, R. M. (1979). *A Practical Approach to Measurement in Physical Education*, Philadelphia: Lea and Febiger, p. 1.
5. Bompa, Tudor O. (1999). *Periodization: Theory and Methodology of Training*, (4th ed.), Champaign, Illinois: Human Kinetics Publishers, p. 24.
6. Chu, D. (1992). *Jumping into Plyometrics*. Champaign, IL: Human Kinetics.
7. Donald, A. C. (1998). *Jumping Into Plyometrics*. California: Human Kinetic Publisher.
8. Mindaugas Balciunas, Stanislovas Stonkus, Catarina Abrantes & Jaime Sampaio. (2006). Long term effects of different training modalities on power, speed, skill and anaerobic capacity in young

- male basketball players. *Journal of Sports Science and Medicine* 5, 163-170.
9. Singh, H. (1991). *Science of Sports Training*. New Delhi: D.V.S. Publications.
  10. Stephenson, J and Swank, AM. Core training: Designing a program for anyone. *Strength Cond J.* 26 34–37, 2004.
  11. Willardson, JM. Core stability training: Applications to sports conditioning programs. *J Strength Cond Res.* 21: 979–985, 2007.
  12. Cannone, Jesse. *Functional training*. Retrieved 2007-08-26.

SEARCH THIS SITE

ANNOUNCEMENT



2015 VOLUME 2 ISSUE 7

SUBJECT AREA

[Engineering & Physical Sciences](#)

- Physics
- Kinetics
- Mechanics
- Electromagnetics
- Thermodynamics
- Aerodynamics
- Chemistry
- Inorganic Chemistry
- Electrochemistry
- Analytical Chemistry
- Geology
- Meteorology
- Astronomy
- Mathematics
- Statistics
- Engineering
- Computer Science

[Life Sciences](#)

- Genetics
- Biology
- Botany
- Zoology
- Microbiology

[Social Science and Humanities](#)

- Business
- Management
- Economics
- Education
- Physical Education
- Political Science
- Psychology
- Sociology
- Finance
- Linguistics
- Social Sciences

[Health Science](#)

- Dermatology
- Dentistry
- Pharmacology
- Toxicology
- Endocrinology
- Immunology
- Veterinary Medicine
- Nursing

and

CERTIFICATE

CATEGORIES

- [Current Issue](#)
- [Special Issue](#)
- [Past Issue](#)
- [Contact us](#)
- [Instructions to Authors](#)
- [Author Guidelines](#)
- [Copy rights](#)
- [Publication Charges](#)
- [Award winners](#)
- [Disclaimer](#)

IMPACT FACTOR



QR CODE



CURRENT ISSUE



PAST ISSUE

S.No	Title / Authors	Download
1	Effect of Aerobic Dance on Selected Physiological and Biochemical Variables of Obese Adolescent Girls <b>R. Umamaheswari, Dr. A. Mahaboobjan</b>	
2	Effects of Aerobic and Anaerobic Training Followed by Cessation on 800 Metres Run of Anna University Men Players <b>P. Sridar</b>	
3	Study of Relationship Between Selected Motor Fitness Components and Overall Playing Ability of College Men Kho-Kho Players <b>Dr. P. Senthilkumar</b>	
4	Impact of Specific Training with and without Mental Toughness on Selected Bio-Motor Psychological and Performance Variables on Hockey Players <b>Dr.P.Babu</b>	
5	Prediction of Batting Abilities from the Selected Kinanthropometric Physical and Physiological Variables among Cricketers <b>S.Bharathiraja, M.Umaheswari, Dr.A.Palanisamy</b>	
6	Impact of Chakra Sadhana on Selected Respiratory Physiological and Socio Psychological Factors among Adolescent Boys <b>S.Nithya, Dr.G.Ravindran</b>	
7	Effects of Medicine Ball Training on Selected Fitness Performance of Physical Education Students <b>Dr.A.Merlin Thanka Daniel</b>	
8	A Study on Emotional Intelligence Among B.Ed., Trainees in Trichy District <b>Dr.K.Vijayarani</b>	
9	Effect of Functional Core Training on Selected Skill performances among Basketball Players <b>Siby Lukose &amp; Dr.P.K.Senthilkumar</b>	
10	Effects of Physical Exercises and Yogic Practice on Selected Health Related Physical Fitness of Residential College Men Students <b>R. Sathish Kumar &amp; Dr. M. Raj Kumar</b>	



MONTHLY ARCHIVE

- [December 2015](#)
- [November 2015](#)
- [October 2015](#)
- [September 2015](#)
- [August 2015](#)
- [July 2015](#)
- [June 2015](#)
- [May 2015](#)
- [April 2015](#)
- [March 2015](#)
- [February 2015](#)
- [January 2015](#)

11	Emotional Maturity Level of Athletes and Non Athletes <b>K. Jayachandran</b>	
12	A Philosophical Viewpoint on Sports Learning <b>Dr. K. Rajendran</b>	
13	Studies on Swelling Properties of IPNs of Cross Linked Biopolyesters of Castor Oil and Cardanol <b>T. Jothy Stella</b>	
14	Efficacy of Yoga Therapy on Selected Bio-Chemical Variables among Men Type II Diabetic Patients <b>Dr.S.Selvalakshmi</b>	



EDITOR- IN - CHIEF



Dr.M Suresh Kumar  
India





## Effect of Functional Core Training on Selected Skill performances among Basketball Players

Siby Lukose<sup>1</sup> & Dr.P.K.Senthilkumar<sup>2</sup>

<sup>1</sup>Ph.D Scholar (Part Time), Department of Physical Education, Tamilnadu Physical Education and Sports University, Chennai, Tamil Nadu, India.

<sup>2</sup>Assistant Professor, Department of Exercise Physiology, Tamilnadu Physical Education and Sports University, Chennai, Tamil Nadu, India.

Received 25th May 2015, Accepted 15th July 2015

### Abstract

The purpose of the study was to find out the effect of functional core training on selected skill performances among basketball players. To achieve the purpose of the present study, thirty men basketball players from Ernakulam district, Kerala state, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects were divided into two equal groups of fifteen subjects each. The subjects (N=30) were randomly assigned to two equal groups of fifteen subjects each. Pre test was conducted for all the subjects on selected skill performances. This initial test scores formed as pre test scores of the subjects. The groups were assigned as Experimental Group and Control Group in an equivalent manner. Experimental Group was exposed to functional core training and Control Group was not exposed to any experimental training other than their regular daily activities. The duration of experimental period was 12 weeks. After the experimental treatment, all the thirty subjects were tested on their skill performance variables. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to dependent 't' test. In all cases 0.05 level of significance was fixed to test hypotheses. The functional core training had positive impact on shooting, passing and dribbling among college basketball players.

**Keywords:** Functional Core Training, Shooting, Passing, Dribbling, Basketball.

© Copy Right, IJRRAS, 2015. All Rights Reserved.

### Introduction

Basketball involves approximately 450 million registered participants from over 200 national federations belonging to the Federation Internationale de Basketball (FIBA). Basketball which originated from America and has been most popular in that country has now become a game of international repute. It is played nearly everywhere in the world. Basket ball is a game much similar to the one played in ancient times by Mayas of Mexico. Basketball was invented by Dr.James Naismith in 1891. The first tournament was conducted in the year 1892. The first professional league was formed in the United States in 1899. A soccer ball was earlier used. By 1941, it was changed to the present day molded ball. The courts have also undergone many changes. The courts were small and irregular in the beginning. In 1915, the National Joint rules committee was formed to set up single code governing the game. The basketball is a ball game played by two teams of 5 players, plus 7 substitutes in each team. The players may pass, throw, roll bat or dribble the ball. The main aim of a basketball player is to obtain points by putting the ball into the basket of the opponent team's court. A goal is considered when the ball enters into the basket from above and passes through or remain in the net. In case score of both

the teams are equal at the end, extra periods of 5 minutes each are provided to break the tie. The match is won by the team scoring greater number of points, or when the opponent team refuses to play, or declared winner by referee due to any other reason (Arias, 2012).

Functional core training is about power, strength and stabilization. Core muscles create a solid base for your body, allowing you to stay upright and stand strong on your two feet. Core work allows you to stabilize your spine, which improves and controls your posture. Functional core training allows you to practice movement that provides optimal motion for daily tasks. Challenging your core not only improves balance and functional movement, but it creates that toned look that so many people crave (Stephenson & Swank, 2004).

### Methodology

The purpose of the study was to find out the effect of functional core training on selected skill performances among basketball players. To achieve the purpose of the present study, thirty men basketball players from Ernakulam district, Kerala state, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects were divided into two equal groups of fifteen subjects each. The subjects (N=30) were randomly assigned to two equal groups of fifteen subjects each. Pre test was conducted for all the subjects on selected skill performances. This initial test

### Correspondence

Siby Lukose,

E-mail: sibylukose@live.in, Ph: +9199955 55644

scores formed as pre test scores of the subjects. The groups were assigned as Experimental Group and Control Group in an equivalent manner. Experimental Group was exposed to functional core training and Control Group was not exposed to any experimental training other than their regular daily activities. The duration of experimental period was 12 weeks. After the experimental treatment, all the thirty subjects were tested on their skill performance variables. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to dependent ‘t’ test.

In all cases 0.05 level of significance was fixed to test hypotheses.

**Results**

The findings pertaining to analysis of dependent ‘t’ test between experimental group and control group on selected skill performances college basketball players for pre-post test respectively have been presented in table I to II.

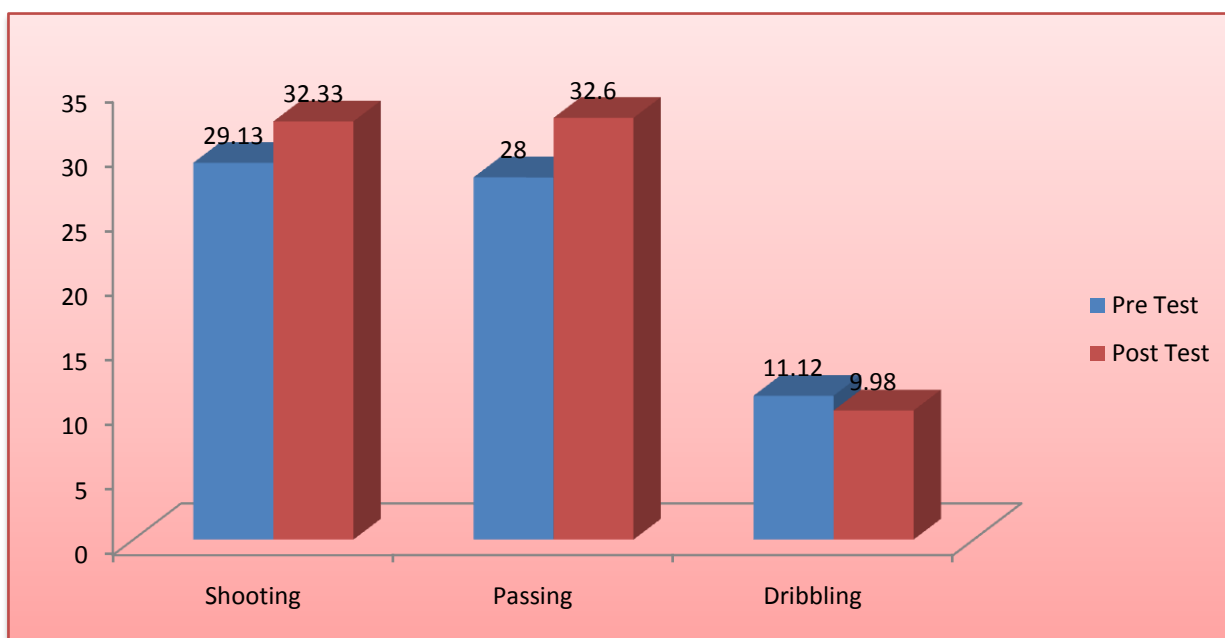
**Table I.** Significance of mean gains & losses between pre and post test scores on selected variables of functional core training group

S.No	Variables	Pre-Test Mean	Post-Test Mean	Mean difference	Std. Dev (±)	σ DM	‘t’ Ratio
1	Shooting	29.13	32.33	3.20	2.07	0.53	5.96*
2	Passing	28.00	32.60	4.60	1.80	0.46	9.87*
3	Dribbling	11.12	9.98	1.14	0.26	0.06	16.63*

An examination of table-I indicates that the obtained ‘t’ ratios were 5.96, 9.87 and 16.63 for shooting, passing and dribbling respectively. The obtained ‘t’ ratios were found to be greater than the required table value of 2.14 at 0.05 level of significance for 14 degrees of

freedom. So it was found to be significant. The results of this study showed that statistically significant and explained its effects positively. The graphical representation of data has been presented in figure I.

**Figure I.** Comparisons of pre – test means and post – test means for experimental group in relation to physiological variables

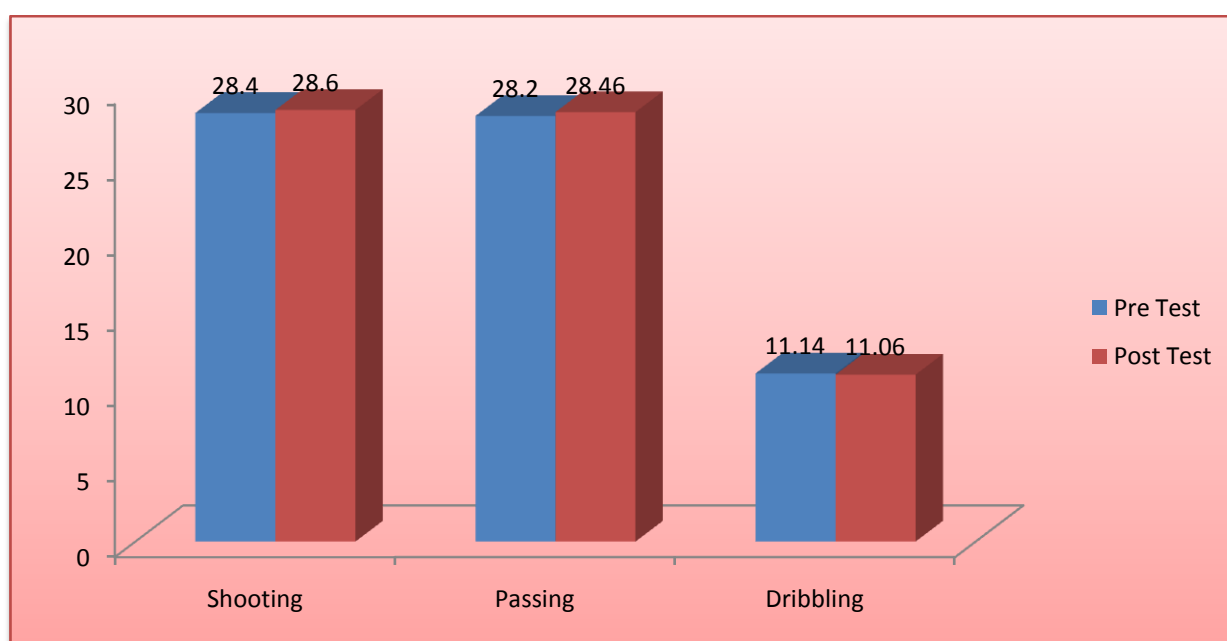


**Table II.** Significance of mean gains & losses between pre and post test scores on selected variables of control group

S.No	Variables	Pre-Test Mean	Post-Test Mean	Mean difference	Std. Dev ( $\pm$ )	$\sigma$ DM	't' Ratio
1	Shooting	28.40	28.60	0.20	0.94	0.24	0.82
2	Passing	28.20	28.46	0.26	1.66	0.43	0.61
3	Dribbling	11.14	11.06	0.08	0.16	0.04	1.92

An examination of table-II indicates that the obtained 't' ratios were 0.82, 0.61 and 1.92 for shooting, passing and dribbling respectively. The obtained 't' ratios were found to be lesser than the required table value of

2.14 at 0.05 level of significance for 14 degrees of freedom. So it was found to be insignificant. The graphical representation of data has been presented in figure II.

**Figure II.** Comparisons of pre – test means and post – test means for control group in relation to physiological variables

In case of skill performances i.e. shooting, passing and dribbling the results between pre and post test has been found significantly higher in experimental group in comparison to control group. This is possible because due to regular functional core training which may also bring sudden spurt in skill performances in basketball players. The findings of the present study have strongly indicates that functional core training of twelve weeks have significant effect on selected skill performances i.e., shooting, passing and dribbling of college basketball players.

### Conclusions

On the basis of findings and within the limitations of the study the following conclusions were drawn:

1. The functional core training had positive impact on shooting, passing and dribbling among college basketball players.

2. The experimental group showed better improvement on shooting, passing and dribbling among college basketball players than the control group.

### References

1. Arias, J.L. (2012). Performance as a function of shooting style in basketball players under 11 years of age. *Percept Mot Skills*. 114(2):446-56.
2. Barrow, H. M. & McGee, R. M. (1979). *A Practical Approach to Measurement in Physical Education*, Philadelphia: Lea and Febiger, p. 1.
3. Bompa, Tudor O. (1999). *Periodization: Theory and Methodology of Training*, (4th ed.), Champaign, Illinois: Human Kinetics Publishers, p. 24.
4. Mindaugas Balciunas, Stanislovas Stonkus, Catarina Abrantes & Jaime Sampaio. (2006). Long term effects of different training modalities on power, speed, skill and anaerobic capacity in young

- male basketball players. *Journal of Sports Science and Medicine* 5, 163-170.
5. Singh, H. (1991). *Science of Sports Training*. New Delhi: D.V.S. Publications.
  6. Stephenson, J and Swank, AM. Core training: Designing a program for anyone. *Strength Cond J.* 26 34–37, 2004.
  7. Willardson, JM. Core stability training: Applications to sports conditioning programs. *J Strength Cond Res.* 21: 979–985, 2007.
  8. Arias, J.L. (2012). Performance as a function of shooting style in basketball players under 11 years of age. *Percept Mot Skills.* 114(2):446-56.

SEARCH THIS SITE

ANNOUNCEMENT



2015 VOLUME 2 ISSUE 9

SUBJECT AREA

[Engineering & Physical Sciences](#)

- Physics
- Kinetics
- Mechanics
- Electromagnetics
- Thermodynamics
- Aerodynamics
- Chemistry
- Inorganic Chemistry
- Electrochemistry
- Analytical Chemistry
- Geology
- Meteorology
- Astronomy
- Mathematics
- Statistics
- Engineering
- Computer Science

[Life Sciences](#)

- Genetics
- Biology
- Botany
- Zoology
- Microbiology

[Social Science and Humanities](#)

- Business
- Management
- Economics
- Education
- Physical Education
- Political Science
- Psychology
- Sociology
- Finance
- Linguistics
- Social Sciences

[Health Science](#)

- Dermatology
- Dentistry
- Pharmacology
- Toxicology
- Endocrinology
- Immunology
- Veterinary Medicine
- Nursing

CERTIFICATE

S.No	Title / Authors	Download
1	Yoga and Garbavidhya <b>B.R.Parthasarathy &amp; Dr.K.Venkatachalapathy</b>	
2	Effect of Resistance Training with Whey Protein Isolates and Whey Protein Concentrate Supplementation on Muscular Power and Muscular Strength among Sub Junior National Weightlifter <b>Sunkara Srinivasa Rao, Dr.R.Subramanian, Dr.P.K.Senthilkumar</b>	
3	Global Scenario of Sesame indicum L. Research Productivity - a Study based on Science Citation Index <b>Dr.A. Raja &amp; Dr.R. Prabu</b>	
4	Effects of Progressive Muscle Relaxation Training on Self-Confidence among College Volleyball Players <b>L. Karupiah &amp; Dr. A. Palanisamy</b>	
5	The Role of Physical Strength and Yogic Experience: in the Light of Swami Vivekananda <b>Dr.G.Kirubalan &amp; Dr.A.Sellaperumal</b>	
6	Effect of Swissball Training on Selected Physical Variables among Inter-collegiate Male Hockey Players <b>C. Balaji &amp; Dr.B.S.Sha in Sha</b>	
7	The Effect of Using General Assistive and Semi-Competitive Exercises with Weights in the Explosive Power of Legs and Arms and the Level of the Technical Performance of the Snatch Lift <b>Prof. Rizgar Majeed Khudur &amp; Prof. Ismael Mawlood Salih</b>	
8	Effect of Imagery Training and Combined Effect with Game-Specific Training on Selected Skill Performance Variables among Hockey Players <b>K. Pradeep Kumar &amp; Dr.B.S.Sha in Sha</b>	
9	Effect of Plyometric Training on Selected Body Composition among Basketball Players <b>Siby Lukose &amp; Dr.P.K.Senthilkumar</b>	

January 2016

CATEGORIES

- **Current Issue**
- **Special Issue**
- **Past Issue**
- **Contact us**
- **Instructions to Authors**
- **Author Guidelines**
- **Copy rights**
- **Publication Charges**
- **Award winners**
- **Disclaimer**

IMPACT FACTOR



QR CODE



CURRENT ISSUE



PAST ISSUE



MONTHLY ARCHIVE

- [December 2015](#)
- [November 2015](#)
- [October 2015](#)
- [September 2015](#)
- [August 2015](#)
- [July 2015](#)
- [June 2015](#)
- [May 2015](#)
- [April 2015](#)
- [March 2015](#)
- [February 2015](#)
- [January 2015](#)

10	Effects of Physical Exercises and Yogic Practice on Selected Psychological Variables of Residential College Men Students <b>R. Sathish Kumar &amp; Dr. M. Raj Kumar</b>	
11	Influence of 12 Weeks Aerobic Training on Selected Health Related Physical Fitness Variables of Overweight Men <b>K. Jayachandran</b>	
12	Responsibility of Sports Psychologist for Team Performance in Games <b>Dr. K. Rajendran</b>	
13	Effect of Plyometric Training with Yogic Practices on Selected Physiological Variables among Volleyball Players <b>K. Ramkumar &amp; Dr. K.Chandrasekaran</b>	
14	Effect of Vethathri Maharishi's Simplified Kundalini Yoga Practices on Selected Body Composition Variables among Osteo Arthritis Women <b>T. Jenila &amp; Dr. G. R. Valliammal</b>	
15	Swelling Studies of Cross Linked Biopolyesters of Polycastor Oil Fumarate <b>T. Jothy Stella</b>	
16	Efficacy of Yoga Therapy on Selected Bio-Chemical Variables among Middle Aged Hypertensive Women <b>Dr.S.Selvalakshmi</b>	
17	Stress – A fact of life <b>Sreeja, U. Bhasi, Deepthi Chandran &amp; Sajan Jerome</b>	



EDITOR- IN - CHIEF



Dr.M Suresh Kumar  
India





## Effect of Plyometric Training on Selected Body Composition among Basketball Players

Siby Lukose<sup>1</sup> & Dr.P.K.Senthilkumar<sup>2</sup>

<sup>1</sup>Ph.D Scholar (Part Time), Department of Physical Education, Tamilnadu Physical Education and Sports University, Chennai, Tamil Nadu, India.

<sup>2</sup>Assistant Professor, Department of Exercise Physiology, Tamilnadu Physical Education and Sports University, Chennai, Tamil Nadu, India.

Received 5th July 2015, Accepted 10th September 2015

### Abstract

*The purpose of the study was to investigate the effect of plyometric training on selected body composition among basketball players. It was hypothesized that there would be significant differences on selected body composition due to the effect of plyometric among basketball players. For the present study the 30 male basketball players from Ernakulam district, Kerala state, India were selected at random and their age ranged from 18 to 25 years. For the present study pre test – post test random group design which consists of control group and experimental group was used. The subjects were randomly assigned to two equal groups of fifteen each and named as Group 'A' and Group 'B'. Group 'A' underwent plyometric training and Group 'B' have not underwent any training. Body composition was assessed by Bioelectrical Impedance Analyzer. The data was collected before and after twelve weeks of training. The data was analyzed by applying Analysis of Co-Variance (ANCOVA). The level of significance was set at 0.05. The plyometric training had positive impact on BMI and percent body fat among basketball players.*

**Keywords:** Plyometric, BMI, Percent Body Fat, Basketball.

© Copy Right, IJRRAS, 2015. All Rights Reserved.

### Introduction

Basketball which originated from America and has been most popular in that country has now become a game of international repute. It is played nearly everywhere in the world. Basket ball is a game much similar to the one played in ancient times by Mayas of Mexico. Basketball was invented by Dr.James Naismith in 1891. The first tournament was conducted in the year 1892. The first professional league was formed in the United States in 1899. A soccer ball was earlier used. By 1941, in was changed to the present day molded ball. The courts have also undergone many changes. The courts were small and irregular in the beginning. In 1915, the National Joint rules committee was formed to set up single code governing the game.

Plyometrics, employed to develop power and explosive responsiveness, uses the Stretch-Shorten Cycle (SSC). The whole idea is to develop the most amount of force in the shortest possible time. When a muscle is flexed or shortened, it's under tension and will react with a more powerful and explosive contraction due to stored elastic energy. Unlike most other aerobic exercises, gravity becomes a major factor in the workout routine. Strength and flexibility are prerequisites for Plyometric training. The laws of Physics apply. A one-g force is equal to your weight. Two or more g's of force may be

exerted by an individual during a jump. For example, a 250-pound (114 kg) individual would subject forces equal to or greater than 500 lbs (227 kg) of pressure on hip, knee and ankle joints. A 100 (45 kg) pound person would experience force equal to or greater than 200 pounds (91 kg). It's obvious that too much Plyometric training can be damaging to joints, as is the case with all types of exercise (Donald, 1998).

### Methodology

The purpose of the study was to investigate the effect of plyometric training on selected body composition among basketball players. It was hypothesized that there would be significant differences on selected body composition due to the effect of plyometric among basketball players. For the present study the 30 male basketball players from Ernakulam district, Kerala state, India were selected at random and their age ranged from 18 to 25 years. For the present study pre test – post test random group design which consists of control group and experimental group was used. The subjects were randomly assigned to two equal groups of fifteen each and named as Group 'A' and Group 'B'. Group 'A' underwent plyometric training and Group 'B' have not underwent any training. Body composition was assessed by Bioelectrical Impedance Analyzer. The data was collected before and after twelve weeks of training. The data was analyzed by applying Analysis of Co-Variance (ANCOVA). The level of significance was set at 0.05.

### Correspondence

Siby Lukose,  
E-mail: sibylukose@live.in, Ph: +9199955 55644

**Results**

The findings pertaining to analysis of co-variance between experimental group and control group

on selected body composition among basketball players for pre-post test respectively have been presented in table I to II.

**Table I.** ANCOVA between Experimental Group and Control Group on BMI of Basketball players for Pre, Post and Adjusted Test

	Experimental Group	Control Group	Source of Variance	Sum of Squares	df	Mean Square	F
Pre Test Mean	24.80	24.24	BG	2.35	1	2.35	1.42
			WG	46.08	28	1.64	
Post Test Mean	22.26	24.14	BG	26.69	1	26.69	19.80*
			WG	37.75	28	1.34	
Adjusted Post Mean	22.09	24.31	BG	35.28	1	35.28	45.22*
			WG	21.06	27	0.78	

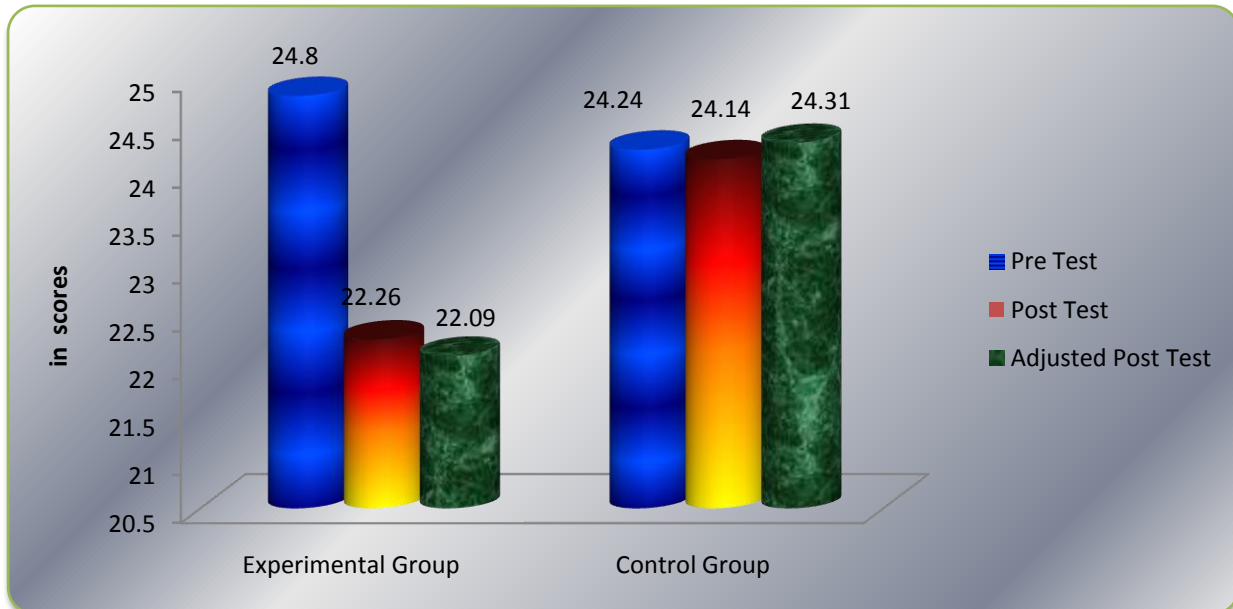
\* Significant at 0.05 level.

df: 1/27= 4.21

Table I revealed that the obtained ‘F’ value of 45.22 was found to be significant at 0.05 level with df 1, 27 as the tabulated value of 4.21 required to be significant at 0.05 level. The same table indicated that

there was a significant difference in adjusted means of BMI of basketball players between experimental group and control group. The graphical representation of data has been presented in figure I.

**Figure I.** Comparisons of Pre – Test Means Post – Test Means and Adjusted Post – Test Means for Control group and Experimental Group in relation to BMI



**Table II.** ANCOVA between Experimental Group and Control Group on Percent body fat of Basketball players for Pre, Post and Adjusted Test

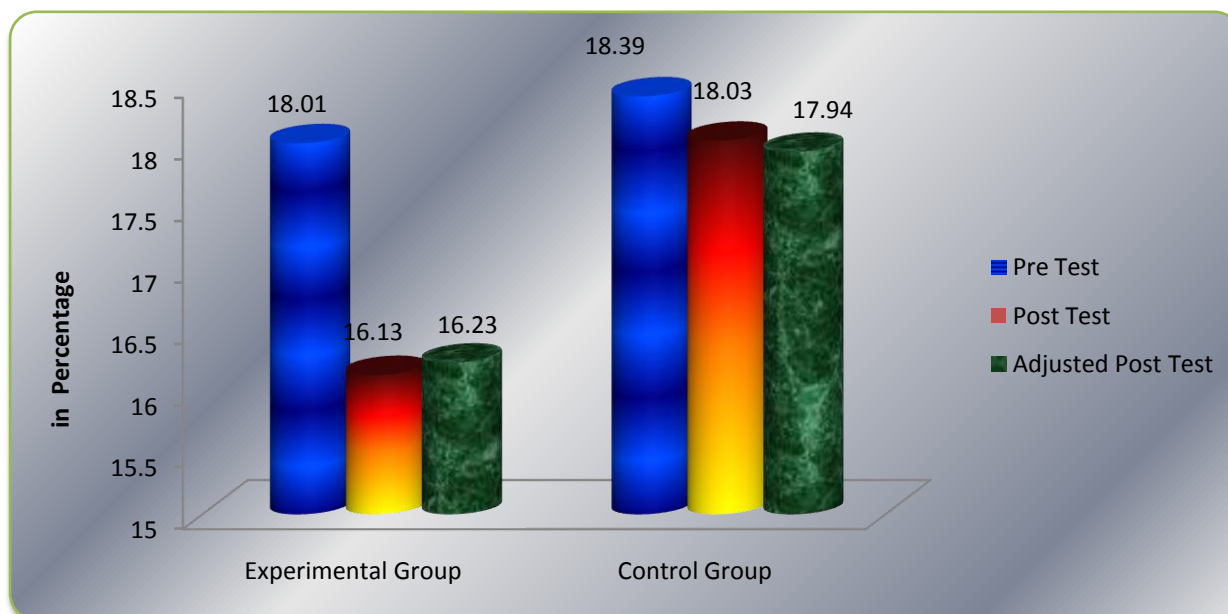
	Experimental Group	Control Group	Source of Variance	Sum of Squares	df	Mean Square	F
Pre Test Mean	18.01	18.39	BG	1.10	1	1.10	1.38
			WG	22.42	28	0.80	
Post Test Mean	16.13	18.03	BG	27.09	1	27.09	17.99*
			WG	42.17	28	1.50	
Adjusted Post Mean	16.23	17.94	BG	20.91	1	20.91	15.39*
			WG	36.68	27	1.35	

\* Significant at 0.05 level.

df: 1/27= 4.21

Table II revealed that the obtained 'F' value of 15.39 was found to be significant at 0.05 level with df 1, 27 s the tabulated value of 4.21 required to be significant at 0.05 level. The same table indicated that there was a

significant difference in adjusted means of percent body fat of basketball players between experimental group and control group. The graphical representation of data has been presented in figure II.

**Figure II.** Comparisons of Pre – Test Means Post – Test Means and Adjusted Post – Test Means for Control group and Experimental Group in relation to Percent body fat

In case of body composition i.e. BMI and percent body fat the results between pre and post (12 weeks) test has been found significantly higher in experimental group in comparison to control group. The findings of the present study have strongly indicates that plyometric training of twelve weeks have significant effect on selected body composition i.e., BMI and percent body fat of basketball players. Hence the hypothesis earlier set that plyometric training programme would have been significant effect on selected body composition in light of the same the hypothesis was accepted.

### Conclusions

On the basis of findings and within the limitations of the study the following conclusions were drawn:

1. The plyometric training had positive impact on BMI and percent body fat among basketball players.
2. The experimental group showed better improvement on BMI and percent body fat among basketball players than the control group.

**References**

1. Abass, A.O. (2009). Comparative Effect of Three Modes of Plyometric Training on Leg Muscle Strength of University Male Students. *European Journal of Scientific Research*. Vol.31 No.4, pp.577-582.
2. Ahmed, T. (2013). The effect of upper extremity fatigue on grip strength and passing accuracy in junior basketball players. *J Hum Kinet*. 5;37:71-9.
3. Alejandro, V., Santiago, S., Gerardo, V.J., Carlos, M.J. & Vicente, G.T. (2015). Anthropometric Characteristics of Spanish Professional Basketball Players. *J Hum Kinet*. 10;46:99-106.
4. Arias, J.L. (2012). Performance as a function of shooting style in basketball players under 11 years of age. *Percept Mot Skills*. 114(2):446-56.
5. Barrow, H. M. & McGee, R. M. (1979). *A Practical Approach to Measurement in Physical Education*, Philadelphia: Lea and Febiger, p. 1.
6. Chu, D. (1992). *Jumping into Plyometrics*. Champaign, IL: Human Kinetics.
7. Donald, A. C. (1998). *Jumping Into Plyometrics*. California: Human Kinetic Publisher.
8. Mindaugas Balciunas, Stanislovas Stonkus, Catarina Abrantes & Jaime Sampaio. (2006). Long term effects of different training modalities on power, speed, skill and anaerobic capacity in young male basketball players. *Journal of Sports Science and Medicine* 5, 163-170.
9. Sedano, S., Matheu, A., Redondo, J.C. & Cuadrado, G. (2011). *Effects of plyometric training on explosive strength, acceleration capacity and kicking BMI in young elite soccer players*. *J Sports Med Phys Fitness*. 51(1):50-8.
10. Singh, H. (1991). *Science of Sports Training*. New Delhi: D.V.S. Publications.

SEARCH THIS SITE

ANNOUNCEMENT



2015 VOLUME 2 ISSUE 10

SUBJECT AREA

[Engineering & Physical Sciences](#)

- Physics
- Kinetics
- Mechanics
- Electromagnetics
- Thermodynamics
- Aerodynamics
- Chemistry
- Inorganic Chemistry
- Electrochemistry
- Analytical Chemistry
- Geology
- Meteorology
- Astronomy
- Mathematics
- Statistics
- Engineering
- Computer Science

[Life Sciences](#)

- Genetics
- Biology
- Botany
- Zoology
- Microbiology

[Social Science and Humanities](#)

- Business
- Management
- Economics
- Education
- Physical Education
- Political Science
- Psychology
- Sociology
- Finance
- Linguistics
- Social Sciences

[Health Science](#)

- Dermatology
- Dentistry
- Pharmacology
- Toxicology
- Endocrinology
- Immunology
- Veterinary Medicine
- Nursing

and

CERTIFICATE

CATEGORIES

- [Current Issue](#)
- [Special Issue](#)
- [Past Issue](#)
- [Contact us](#)
- [Instructions to Authors](#)
- [Author Guidelines](#)
- [Copy rights](#)
- [Publication Charges](#)
- [Award winners](#)
- [Disclaimer](#)

IMPACT FACTOR



QR CODE



CURRENT ISSUE



PAST ISSUE

S.No	Title / Authors	Download
1	Influence of Medicine Ball Exercise and Resistance Training Programme on Selected Physical Variable and Skill Performance of Inter-collegiate Men Handball Players <b>L. Karuppiah &amp; Dr. A. Palanisamy</b>	
2	Comparative Study of Achievement Motivation among the Students of Medical, Engineering and Physical Education Profession <b>Sangeetha, K.</b>	
3	Assessment of Aerobic Training and Detraining Impact on Systolic Blood Pressure in People with Mild Hypertension <b>Telikicherla Venkata K K L Prasad &amp; Dr. I. Devi Vara Prasad</b>	
4	Effect of High Intensity Circuit Resistance Training on Selected Strength and Physiological Parameters <b>Dr. Y. Wise Blessed Singh &amp; Dr. P. Senthil Kumar</b>	
5	Higher Attrition Rate – A Critical Challenge Faced by the Human Resources Manager with Reference to Private Insurance Sectors <b>Dr. T.Vetrivel &amp; P.Prabakaran</b>	
6	Effect of Isolated and Combined Strength and Endurance Training on Strength Endurance of Kabaddi Players <b>G. Syam Kumar &amp; Dr. M.V.Srinivasan</b>	
7	Effect of Aerobic Dance on Selected Physiological and Biochemical Variables of Obese Adolescent Girls <b>R. Umamaheswari &amp; Dr. A. Mahaboobjan</b>	
8	Role of Adequate and Fair Compensation on Sports Coaches Working at Government Sector Organisations in Tamil Nadu <b>P. Rajan &amp; Dr. S. Prem Kumar</b>	
9	Effect of Plyometric and Functional Core Training on Selected Physical Fitness Components among Basketball Players <b>Siby Lukose &amp; Dr.P.K.Senthilkumar</b>	
10	Effect of High Tempo Music on Sweat Rate and Achievement Motivation <b>P.Prabhu Pandian &amp; Dr M.Raj Kumar</b>	



MONTHLY ARCHIVE

- December 2015
- November 2015
- October 2015
- September 2015
- August 2015
- July 2015
- June 2015
- May 2015
- April 2015
- March 2015
- February 2015
- January 2015

11	Effect of Varied Modes of Yogic Practices on Selected Co-ordinative Abilities of Professional College Students <b>K.Sagadevan &amp; Dr.K.Chandrasekaran</b>	
12	Effect of Hatha Yoga Sadhana on Selected Physiological Variables among Anorexia Syndrome Teenage Girls <b>M.Ganga &amp; Dr. K.Chandrasekaran</b>	
13	Impact of Hatha Yoga Sadhana on Selected Socio Environmental Factors among Dyslexic Primary Children <b>M.Deepa &amp; Dr. A.M.Moorthy</b>	
14	Effect of Static and Dynamic Hatha Yoga Sadhana on Pubertal Development Dimension among Preteen Girls <b>R. Kalpana &amp; Dr. S Thirumalaikumar</b>	
15	Study on Yogic Practice and Physical Exercises on Selected Psychological Variables among Male College Cricket Players <b>Dr. N. S. Sivakumar</b>	
16	Effect of Adaptive Yoga Module on Psychomotor Abilities among Elderly Men Living in Old Age Homes <b>Padmanabhan, T.V &amp; Dr.K.Chandrasekaran</b>	
17	Effect of Sand and Land Plyometric Training on Speed and Explosive Power among Kabaddi Players <b>K. Jayachandran</b>	
18	Influence of Different Types of Stretching with Precise Football Training Parcels on Variety of Motion of Football Players <b>Dr. K. Rajendran</b>	
19	Determination of Physico Chemical Properties of Biopolyester Resins from Castor Oil <b>T. Jothy Stella</b>	
20	Effects of Yogic Practices on Physiological and Haematological Variables among Peptic Ulcer Diseased Persons <b>Dr.S.Selvalakshmi</b>	



EDITOR- IN - CHIEF



Dr.M Suresh Kumar  
India







## Effect of Plyometric and Functional Core Training on Selected Physical Fitness Components among Basketball Players

Siby Lukose<sup>1</sup> & Dr.P.K.Senthilkumar<sup>2</sup>

<sup>1</sup>Ph.D Scholar (Part Time), Department of Physical Education, Tamilnadu Physical Education and Sports University, Chennai, Tamil Nadu, India.

<sup>2</sup>Assistant Professor, Department of Exercise Physiology, Tamilnadu Physical Education and Sports University, Chennai, Tamil Nadu, India.

Received 1st August 2015, Accepted 10th October 2015

### Abstract

The purpose of the study was to find out the effect of plyometric and functional core training on selected physical fitness components among basketball players. To achieve the purpose of the present study, forty five men basketball players from Ernakulam district, Kerala state, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects (N=45) were randomly assigned to three equal groups of fifteen subjects each. Pre test was conducted for all the subjects on selected physical fitness components. This initial test scores formed as pre test scores of the subjects. The groups were assigned as Experimental Group I, Experimental Group II and Control Group in an equivalent manner. Experimental Group I was exposed to plyometric training, Experimental Group II was exposed to functional core training and Control Group was not exposed to any experimental training other than their regular daily activities. The duration of experimental period was 12 weeks. After the experimental treatment, all the forty five subjects were tested on their physical fitness components variables. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to statistical analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant, Scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses. The plyometric training had shown better performance on explosive strength than the other groups. The functional core training had showed better performance on muscular endurance than the other groups.

**Keywords:** Plyometric, Core Training, Explosive Strength, muscular Strength, Basketball.

© Copy Right, IJRRAS, 2015. All Rights Reserved.

### Introduction

Basketball is a very demanding and physically challenging game. The ability of today's athletes has far exceeded the limits of the game put on it by the original inventors. The skills required of today's players are incredibly different than those of yesterday. Basketball now allows for individual athletes to exhibit physical aptitude within the context of an offense or defense. The attributes of speed, change of direction and power rule the game as we know it today. Nowadays there are several training methods that have been developed and adopted to increase the demands of the sports. Sport training is a physical, technical, moral and intellectual participation of an athlete with the help of physical exercises. It is a planned process for the participation of athlete and players to achieve top level performance (Mindaugas et al. 2006).

Plyometric training is an excellent way to train for the demands of basketball. Plyometric drills should be progressive in nature and extend through the preparatory and preseason cycles of training. In season

plyometric training is often too much for players who are maintaining a full schedule of two to four games per week (Chu, 1992). The importance of core stabilization system in creating stability and power system during sport activities has an important consideration. It is believed that a strong core allows an athlete the full transfer of forces generated with the lower extremities, through the torso, and to the upper extremities (Willardson, 2007)

### Methodology

The purpose of the study was to find out the effect of plyometric and functional core training on selected physical fitness components among basketball players. To achieve the purpose of the present study, forty five men basketball players from Ernakulam district, Kerala state, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects (N=45) were randomly assigned to three equal groups of fifteen subjects each. Pre test was conducted for all the subjects on selected physical fitness components. This initial test scores formed as pre test scores of the subjects. The groups were assigned as Experimental Group I, Experimental Group II and Control Group in an equivalent manner. Experimental

### Correspondence

Siby Lukose,  
E-mail: sibylukose@live.in, Ph: +9199955 55644

Group I was exposed to plyometric training, Experimental Group II was exposed to functional core training and Control Group was not exposed to any experimental training other than their regular daily activities. The duration of experimental period was 12 weeks. After the experimental treatment, all the forty five subjects were tested on their physical fitness components. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to statistical analysis using Analysis of

Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant, Scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses.

### Results and Discussion

The detailed procedure of analysis of data and interpretation were given below,

**Table I.** Computation of analysis of covariance of mean of plyometric and functional core training and control groups on explosive strength

	Plyometric Training	Functional Core Training	Control Group	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	27.80	28.06	27.26	BG	4.97	2	2.48	1.04
				WG	100.26	42	2.38	
Post-Test Means	40.46	36.46	27.33	BG	1359.51	2	679.75	38.96*
				WG	732.80	42	17.44	
Adjusted Post-Test Means	40.45	36.40	27.41	BG	1294.59	2	647.29	36.38*
				WG	729.35	41	17.78	

An examination of table - I indicated that the pre test means of plyometric, functional core training and control groups were 27.80, 28.06 and 27.26 respectively. The obtained F-ratio for the pre-test was 1.04 and the table F-ratio was 3.22. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that there were no significant difference between the experimental and control groups indicating that the process of randomization of the groups was perfect while assigning the subjects to groups. The post-test means of plyometric, functional core training and control groups were 40.46, 36.36 and 27.33 respectively. The obtained F-ratio for the post-test was 38.96 and the table F-ratio was 3.22. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of

freedom 2 and 42. This proved that the differences between the post test means of the subjects were significant.

The adjusted post-test means of plyometric, functional core training and control groups were 40.45, 36.40 and 27.41 respectively. The obtained F-ratio for the adjusted post-test means was 36.38 and the table F-ratio was 3.23. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. This proved that there was a significant difference among the means due to the experimental trainings on explosive strength. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. The results were presented in Table-II.

**Table II.** The scheffe's test for the differences between the adjusted post test paired means on explosive strength

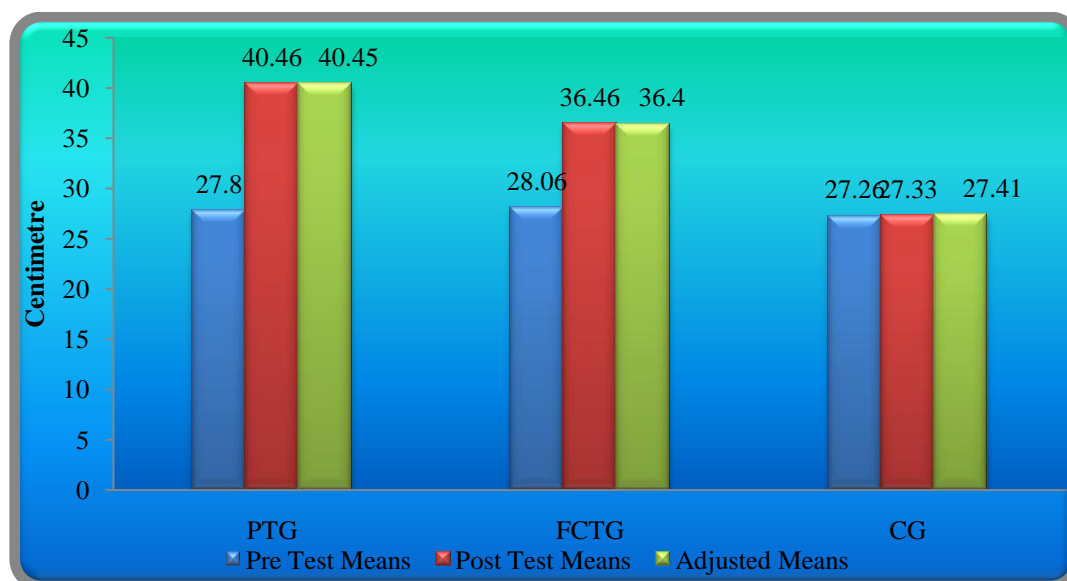
Adjusted Post-test means			Mean Difference	Required CI
Plyometric Training	Functional Core Training	Control Group		
40.45	36.40	---	4.05*	3.90*
40.45	---	27.41	13.04*	
---	36.40	27.41	8.99*	

\* Significant at 0.05 level of confidence

The multiple comparisons showed in Table II proved that there existed significant differences between the adjusted means of plyometric training and functional core training group (4.05), plyometric training and control group (13.04), functional core training and

control group (8.99) at 0.05 level of confidence with the confidence interval value of 3.90. The pre, post and adjusted means on explosive strength were presented through bar diagram for better understanding of the results of this study in Figure-I.

**Figure I.** Pre post and adjusted post test differences of the, plyometric training, functional core training and control groups on explosive strength



**Table III.** Computation of analysis of covariance of mean of plyometric and functional core training and control groups on muscular endurance

	Plyometric Training	Functional Core Training	Control Group	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	35.40	35.26	34.66	BG	4.57	2	2.28	1.09
				WG	87.86	42	2.09	
Post-Test Means	39.86	42.66	34.86	BG	468.40	2	234.20	53.22*
				WG	184.80	42	4.40	
Adjusted Post-Test Means	39.85	42.66	34.88	BG	448.22	2	224.11	49.75*
				WG	184.66	41	4.50	

An examination of table - III indicated that the pre test means of plyometric, functional core training and control groups were 35.40, 35.26 and 34.66 respectively. The obtained F-ratio for the pre-test was 1.09 and the table F-ratio was 3.22. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that there were no significant difference between the experimental and control groups indicating that the process of randomization of the groups was perfect while assigning the subjects to groups. The post-test means of plyometric, functional core training and control groups were 39.86, 42.66 and 34.86 respectively. The obtained F-ratio for the post-test was 53.22 and the table F-ratio was 3.22. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of

freedom 2 and 42. This proved that the differences between the post test means of the subjects were significant. The adjusted post-test means of plyometric, functional core training and control groups were 39.85, 42.66 and 34.88 respectively. The obtained F-ratio for the adjusted post-test means was 49.75 and the table F-ratio was 3.23. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. This proved that there was a significant difference among the means due to the experimental trainings on muscular endurance. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. The results were presented in Table III.

**Table III.** The scheffe’s test for the differences between the adjusted post test paired means on muscular endurance

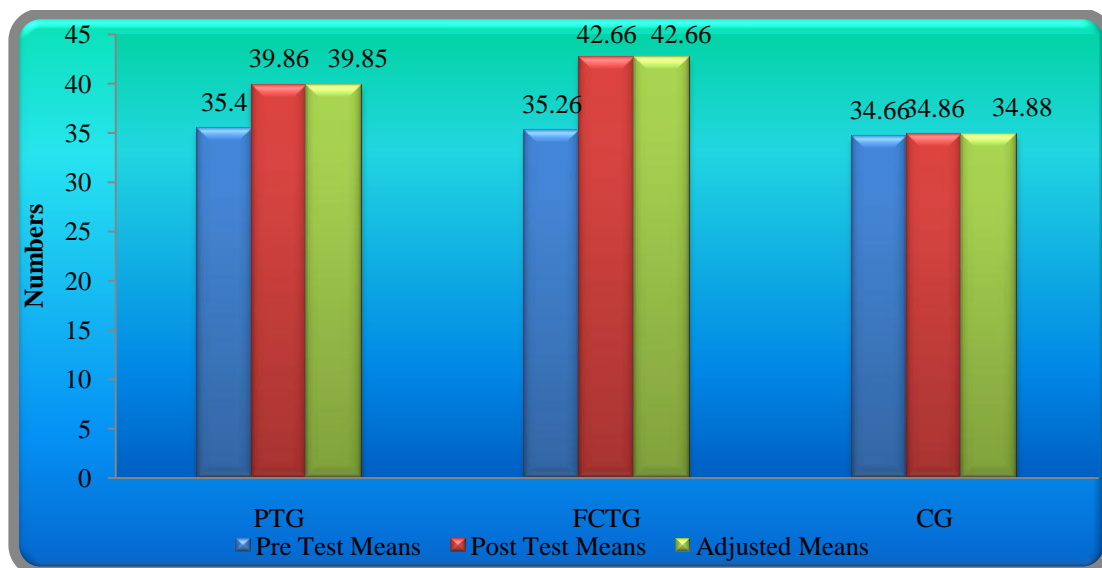
Adjusted Post-test means			Mean Difference	Required CI
Plyometric Training	Functional Core Training	Control Group		
39.85	42.66	---	2.81*	1.96
39.85	---	34.88	4.97*	
---	42.66	34.88	7.78*	

\* Significant at 0.05 level of confidence

The multiple comparisons showed in Table III proved that there existed significant differences between the adjusted means of plyometric training and functional core training group (2.81), plyometric training and control group (4.97), functional core training and control

group (7.78) at 0.05 level of confidence with the confidence interval value of 1.96. The pre, post and adjusted means on muscular endurance were presented through bar diagram for better understanding of the results of this study in Figure-II.

**Figure II.** Pre post and adjusted post test differences of the, plyometric training, functional core training and control groups on muscular endurance



**Conclusions**

In the light of the study undertaken with certain limitations imposed by the experimental conditions, the following conclusions were drawn.

1. The plyometric training had shown better performance on explosive strength than the other groups.
2. The functional core training had showed better performance on muscular endurance than the other groups.

**References**

1. Ahmed, T. (2013). The effect of upper extremity fatigue on grip strength and passing accuracy in junior basketball players. *J Hum Kinet.* 5;37:71-9.
2. Alejandro, V., Santiago, S., Gerardo, V.J., Carlos, M.J. & Vicente, G.T. (2015). Anthropometric Characteristics of Spanish Professional Basketball Players. *J Hum Kinet.* 10;46:99-106.
3. Arias, J.L. (2012). Performance as a function of shooting style in basketball players under 11 years of age. *Percept Mot Skills.* 114(2):446-56.
4. Barrow, H. M. & McGee, R. M. (1979). *A Practical Approach to Measurement in Physical Education*, Philadelphia: Lea and Febiger, p. 1.
5. Bompa, Tudor O. (1999). *Periodization: Theory and Methodology of Training*, (4th ed.), Champaign, Illinois: Human Kinetics Publishers, p. 24.
6. Chu, D. (1992). *Jumping into Plyometrics*. Champaign, IL: Human Kinetics.
7. Donald, A. C. (1998). *Jumping Into Plyometrics*. California: Human Kinetic Publisher.
8. Mindaugas Balciunas, Stanislovas Stonkus, Catarina Abrantes & Jaime Sampaio. (2006). Long term effects of different training modalities on power, speed, skill and anaerobic capacity in young male basketball players. *Journal of Sports Science and Medicine* 5, 163-170.

9. Singh, H. (1991). *Science of Sports Training*. New Delhi: D.V.S. Publications.
10. Stephenson, J and Swank, AM. Core training: Designing a program for anyone. *Strength Cond J.* 26 34–37, 2004.
11. Willardson, JM. Core stability training: Applications to sports conditioning programs. *J Strength Cond Res.* 21: 979–985, 2007.