



## EFFECT OF THE SPECIFIC TRAINING PROGRAMME AND RECOMMENDED DIET ON THE SELECTED PHYSICAL AND PHYSIOLOGICAL PARAMETERS ON THE BASKET BALL PLAYERS

**<sup>1</sup> Dhabe S., <sup>2</sup>Dhabe D. and <sup>3</sup>Chaoji S.**

<sup>1</sup>Govt Institute of Science, Nagpur (M.S) India

<sup>2</sup> IDCPE Nagpur Nagpur (M.S) India

<sup>3</sup>RashtrasantTukdoji Cancer Hospital, Nagpur (M.S) India

Email: sandhyadhabe1964@gmail.com

**Abstract:** In order to study the effect of specific training program on some selected physical and physiological parameters and recommended diet on the basketball players, sixty male basketball players in the age group of 14 to 16 years, from different clubs and schools of Nagpur and Brahmapuri were selected and the subjects were equally divided into two groups; experimental and control group. The experimental group participated in the training program for a period of sixteen weeks. The control group did not participate in the training program. After collecting the data, statistical analysis was carried out and conclusions were drawn.

### Introduction:

#### 1 Basketball

The game of Basketball was originated in America in 1891. For optimal performance during play at an elite level a variety of areas must be addressed. This includes the high skill level, flexibility, muscular strength, endurance and importantly the specific use of the anaerobic energy systems.

Since basketball event involves running, jumping, shooting, changing direction and passing events which need tremendous strength for good performance, it would be better to find out the same through isometric and isotonic exercises. The vital need of all basketball players is tremendous leg power which is necessary for a fast explosive quick movement.

In most of the advanced countries like the U.S.A., Germany, Japan, China, Korea the awareness of motor learning and skill development helps them to realize their dreams of higher achievement in sports. High level performance in basketball not only requires certain physical qualities like speed, endurance, explosive power, agility, flexibility, strength etc. but also physical structure. In addition to the techniques and tactics of a player of a team, physical and physiological characteristics help him for better performance. For many centuries athletes, coaches, trainers and physicians have passed down many radical ideas on

nutrition for optimum sports performance. Therefore in this study we have considered the effect of physical, physiological and nutritional parameters on the performance of basketball players.

#### 2 Statement of the Problem

The objective is to study Effect of specific training program and recommended diet on the selected physical and physiological parameters of basketball players.

#### Delimitation

- The study was delimited to following physical parameters: Speed, Agility, strength, power, flexibility, cardiovascular endurance, General endurance, Balance, Skill and Reaction time.
- For the present study, physiological parameters were delimited to pulse rate, blood pressure measurement. For the present study age of the basketball players is delimited to 14 to 16 years. Further, it is delimited to male players only.
- The study was delimited to the nutritional parameters fats, carbohydrates and proteins.
- The present study was delimited to the specific training program.
- Diet/Nutrition was admitted to the suggestion and recommendation of expert of this field.

- For the present study skill was delimited to skills like passing, shooting, dribbling only.
- Criterion measure for assessing selected skills was AAHPER basketball skill test for boys.
- The study was delimited to the District level competition.

#### **Limitation**

- The study was limited to skill and physical fitness. No special motivational techniques were used to influence the subjects' performance. However, they were encouraged to do their best. Variables that might have occurred in their performance due to lack of the same degree of motivation at the time of pretest and post tests were recognized as a limitation of the study.
- The subject could not be kept under complete control outside the class session and for this reason randomization of the uncontrolled variables and nullification of the possible effects of such variables were assumed.

#### **3 Null Hypothesis**

**H<sub>0</sub>:The hypothesis of the study was that the specific training program had no effect on the selected physical and physiological parameters.**

#### **Objective of the Study**

The objectives of the study are

- To study the nutritional status of players.
- To increase the performance of the players through specific training program.
- To uplift the skill performance of the players.

**Criterion measures for this study were as follows**

#### **Physical Variables**

##### **Variables**

##### **1 Strength**

- Abdominal →
- Leg Explosive →
- Dynamic →

##### **2 Endurance**

- Specific Speed & Skill →

##### **3 Power**

- Legs →

##### **4 Agility**

- Acceleration ability →

- To study the existing performance of the player. To recommend the diet program to the players for improvement of performance.

#### **4 Selection of the subjects**

Seventy-eight male basketball players of Nagpur and Brahmapuri in the age group of 14 to 16 years were selected. The random sampling procedure was adopted for the selection of subjects. All the subjects were required to undergo a medical examination and were found to be fit for the required experiments.

#### **5 Selection of variables**

Following physical, physiological and nutritional variables were selected for the present study.

##### **Physical Variables**

**Strength:** Abdominal Strength, Leg explosive Strength and Dynamic Strength.

**Endurance:** Abdominal endurance, Specific speed and skill.

**Power:** Legs power

**Agility:** Acceleration ability and change of direction, Flexibility, Lower back and hamstring muscle.

**Speed:** Reaction and response time

**Balance:** Static balance.

##### **Cardio-respiratory endurance**

##### **Physical variables – (Skills)**

**Shooting:** Jump shot, Free throw shoot and Three-point shoot.

Passing, Dribbling, Rebounding and, Defensive shuffle

##### **Physiological Variables**

**Blood pressure:** Systolic blood pressure and Diastolic blood pressure.

##### **Pulse rate**

##### **Nutritional Variables**

1 Protein. 2 Fat. And 3 Carbohydrate.

##### **Related Test**

Sit up. – 60 Seconds.

Standing broad Jump.

Three K.g. Medicine ball put.

Ten Lay-up Shoot

Sarjant vertical Jump.

Shuttle Run & change of direction (6X14) meter

**5 Flexibility**

I. Lower back & Hamstring muscle → Sit and reach test without box

**6 Speed→**

50 Meter run.

**7 Reaction and Response Time**

I. Hands & arm. → Nelson speed of Movement test.

**8 Balance**

Static balance on the ball of foot →Strok stand (tumbling test).

**9 Cardio Respiratory Endurance →** Harward Step Test. (Formula of Counting).

**10 Circumference→**

To measure the circumference

(Anthropometric measurements) of upper arm, forearm, waist, thigh, calf.

Anthropometric Variables.

Height, weight, chest.

**Skills****11 Shooting**

A. To measure the accuracy in shooting with speed.→

Jump shoot for 5 minutes from different angles and spots.

B. To assess the free throw shooting ability. →

Free throw: 30 Attempts.

C. To measure the three point shooting ability.→

3-pointsshoot: 30 Attempts.

D. To measure the ability to make successive field goal as quick as possible.→

Field goal test: 30 seconds.

**12 Passing**

A. To assess the speed of passing and ball handling ability →

Speed pass – One minute. (Wall Pass).

**13 Dribbling**

A. To check the ability to control the ball while dribbling →

Zig - Zag dribbling Test.

**14 Rebounding**

A. To measure ball handling skill.

Rebound Test.

**15 Defensive Shuffle**

A. To measure the general agility of the body in maneuvering forward, backward and sideward.

Semo-Agility test.

**Physiological Variables**

**16 Blood Pressure→** Measured in mm/hg. By using B.P. apparatus and stethoscope.

**17 Pulse Rate→** Pulse rate measuring in beats minutes was counted on finger tips and radial artery (P.R. Counting test)

**Nutritional Variables****18 Nutrition→**

24hrs. Recall method.

**Anthropometric Variables**

**19 Age→** The chronological age, as per school record i.e. date, month & year.

**20 Weight→** The weight was measured by using standard weighing machine in kilogram.

**21 Height→** The height was measured by using the steel measuring tape to the nearest of half centimeter.

**22 Chest→** The measurement of the chest (Normal and Expanded) was taken by using steel standard measuring tape in centimeter.

## 6 Collection of data

The data was collected in 2006-07, by contacting eighty basketballers at Nagpur and Brahmapuri. To collect the data selected measures were taken on each subject individually during resting hours. Before the administration of the test the use of equipment were explained and clearly demonstrated by the tester to the subjects to become familiar with various test items to ensure the uniform testing condition. The measurements were taken only in the evening session. The nutritional data was collected through questionnaire only.

## 7 Experimental Design and Procedure

Random group design was adopted for the study. The subjects chosen for the study were divided into two groups; Viz, experimental group and control group. The experimental group was given 16-week training program. The control group was kept away from the 16 weeks training program. Each group consisted of 37 subjects. Out of 37, final observations were recorded only for 30 subjects for both experimental and control group.

To gather the information about nutritional status of all the subjects, the data were collected through questionnaire by "24 Hour recall method". The total intake calorie was recorded and required intake was recommended through intake calorie schedule. But whether the subjects have followed the recommended intake schedule or not, was unknown. Thus, the method adopted was "Recommended diet". Measurements on the variables were taken in the beginning (pre-test) and at the end of the experimental period, after sixteen weeks (post-test). Except for the training schedule day, all the subjects could follow their routine warm and game schedule. Only on the schedule day they were exposed to the training schedule.

## 8 The training Schedule

The whole training program schedule for the experimental group was carefully and systematically planned. The experimental group underwent the training program under the guidance of experts and respected group leaders at one place at one time under the keen supervision for a period of 16 weeks on alternate days viz. thrice in a

week. The objective reflected exactly, what was expected after going through the training program. The control group was not allowed to undergo the training program.

### Description of Exercise

After careful study of literature, some specific exercises suitable for the events, were selected. The subject in the experimental group were asked to perform these exercises (except asna) after warm up; to improve their performance. The list of these specific exercises is given below.

- i) Stretching Exercise.
- ii) Flexibility Exercise.
- iii) Asna.
- iv) Suryanamaskar
- v) Circuit Training.

## 9 Analysis of data and results of the study

### Scoring of data

The subject score on physical and physiological test given before and after completion of experimental period constitutes the score for study. As mentioned earlier the experimental group has undergone sixteen weeks training program and observations/measurements were recorded before and after the training program while the control group was not given any training but still observations were recorded after 16 weeks for the control group also. The analysis of the pre-and post-measurements for control group and experimental group is carried out using "t" test.

### Hypothesis

**H<sub>0</sub>:** Specific training program had no effect on the selected physical and physiological parameters of the basketball players.

### Analysis for the control group.

After carrying out the analysis of the difference between the pre-and post-mean values for the selected physical and physiological parameters for the control group and it was concluded that there is no significant difference between the mean values of pre-and post-measurements of physical and physiological parameters for the control group.

### Analysis for experimental group.

After carrying out the analysis of difference of the pre-and past mean values for the

selected physical, physiological parameters table 1,2,3,4 and 5 respectively.  
the corresponding results are shown in

Table-1. Table showing pre-andpost-test means and their difference for selected physical parameters for the experimental group.

Sr. No.	Item	M <sub>1</sub>	M <sub>2</sub>	M. D.	S. E.	"t" ratio
1	Speed	9.27	8.53	0.737	0.35	2.15 *
2	Agility	35.32	33.21	2.10	0.83	2.57 *
Strength	Dynamic Strength	5.96	6.77	0.81	0.39	2.10 *
	Leg explosive Strength	0.336	0.436	0.10	0.03	3.52'
	Abdominal Strength	21.06	26.80	5.73	2.49	2.33*
4	Power	1.95	2.20	0.25	0.09	2.83*
5	Flexibility	7.19	7.85	0.66	0.18	3.72*
6	Endurance	6.90	5.73	1.16	0.55	2.14*
7	Cardio Respiratory Endurance	98.13	88.83	9.30	1.87	5.05*
8	Balance	2.88	3.84	0.96	0.49	1.97*
9	Reaction time	0.02	0.02	0.00488	0.0024	2.01*

Table-2. Table showing pre-and post-test means and their mean difference for the selected anthropometric parameters for the experimental group

Sr. No.	Item	M <sub>1</sub>	M.	M.D.	S.E.	"t" ratio
1	Upper arm circumference	21.16	22.63	1.46	0.73	2.062*
2	Fore arm circumference	21.66	23.00	1.33	0.63	2.12*
3	Waist circumference	67.23	63.26	3.96	2.03	1.99*
4	Thigh circumference	41.00	44.13	3.13	1.58	2.00*
5	Calf circumference	31.20	33.33	2.13	1.07	2.01*

Table-3. Table showing pre and post-test means and their mean difference for the selected physical skill parameters for the experimental group

Sr No.	Item	M <sub>1</sub>	M <sub>2</sub>	M.D.	S.E.	"t" ratio
1	Passing	36.93	41.40	4.46	1.71	2.64*
2 Shooting	Free Throw	10.50	14.30	3.80	1.55	2.49*
	Three-point shoot	6.70	9.60	2.90	1.39	2.11*
	Jump shot	0.19	0.26	0.074	0.27	2.79*
	Under the basket	0.68	0.72	0.04	0.055	0.83
3	Dribbling	10.12	9.02	1.09	0.43	2.55*
4	Rebounding	0.53	0.70	0.16	0.074	2.24*
5	Defensive shuffle	15.62	14.23	1.42	0.73	1.98*

Table-4. Table showing pre and post test means and their mean difference for the selected physiological parameters for the experimental group

Sr. No.	Item	M <sub>1</sub>	M <sub>2</sub>	M.D.	S.E.	"t" ratio
1	Systolic blood pressure	104.3	101.06	3.66	2.01	1.85
2	Diastolic blood pressure	69.83	66.23	3.60	2.57	1.42
3	Pulse rate	74.26	69.86	4.40	1.37	3.24*

**Note:**

In all the above tables

- i) \* denote the value of "t" significant at 5 % level of significance.
- ii) M<sub>1</sub> denote the value of mean for pretest measurements.
- iii) M<sub>2</sub> denote the value of mean for posttest measurements.

iv) M.D. denote the difference of mean between pre-andpost-test measurements.

v) S.E. denote the standard error of difference of mean between pre-andpost-test measurements

**Discussion on findings:**

It is observed that except for under the basket for all the remaining physical parameters the calculated value of "t" is

greater than the tabulated value of “t” at 5 % level of significance. Therefore, the null hypothesis is accepted for the physical parameter under the basket and it is rejected for all the remaining physical parameters for the experimental group. Similarly, it is observed that the null hypothesis is accepted for the physiological parameters Systolic blood pressure and Diastolic blood pressure and it is rejected for pulse rate for the experimental group. Therefore, based on the experimental data the following conclusion may be drawn. Thus, the result of the study showed that there was significant positive effect of the training program on the selected physical and physiological parameters except for the physical parameters under the basket and physiological parameter Systolic blood pressure and Diastolic blood pressure. Thus, based on analysis of experimental data, it may be concluded that the training program helps to improve the performance of the basketball players.

#### **Conclusion:**

Hence on the basis of collected data, it may be concluded that there is no significant difference between the mean values of pre and post measurements of physical parameter under the basket and the physiological parameter Systolic blood pressure and Diastolic blood pressure for the experimental group and there is a significant difference between the mean values of pre and post measurements of all the remaining physical parameters and physiological parameter for the experimental group.

#### **Recommendations:**

In the light of the conclusions drawn, the following recommendations are made.

Today we are living in the world of cut-throat competition. It is observed that though people know the physical fitness is of utmost importance, it is often neglected. So, for the survival in this cut-throat competition, proper care of physical fitness is must. So, the schools and colleges may introduce different training programs in their curriculum to improve physical and physiological fitness of the children. This will

help them to improve their academic performance also, which will in turn improve their confidence ultimately resulting in a better future for them.

Nutritional status is the level of nourishment of the body. Nutrition affects body size, brain development, performance, capacity to work and life span. Thus, nutritional component plays very important role in the performance of the player. Therefore, basic knowledge of nutrition and nutrients is necessary for every player. But unfortunately, it was observed that for most of the subjects the daily intake of calorie was not as per the requirement. It was less than the requirement. i.e. the nutritional status of most of the players was not good. Therefore, the diet chart prepared by the nutrition experts, was provided to the players. This chart was prepared taking into consideration their height. And they were requested to take diet per that chart. But it was not monitored whether they are really following it or not. Researcher had no control over that. So, statistical analysis for the nutritional components was not carried out. However, it is recommended that for better performance in the game the subjects should take proper care of their nutrition.

#### **References:**

- 1) **Barrow, Harold M, & Brown, Janie P**, “Man & Movement” Lea & Febiger, Philadelphia, 1988.
- 2) **Barrow, Harold M, Mc Gee, Rosemary McGee and Kathleen A** Tritschler, “Practical Measurement in Physical Education and Sport,” Lea and Febiger, Philadelphia, 1989,
- 3) **Behram, Richard E. Kliegman, Robert M. and Jenson, Hal B**, “Nelson’s Textbook of Pediatric” 16<sup>th</sup> ed. (Savders, The Curtis centre, Philadelphia, Pennsylvania 2001)
- 4) Best, **John W.** “Research in Education” Prentice-Hall of India Pvt. Ltd. New Delhi-1992.
- 5) **Bhave, V.N., Deodhar, N.S., Bhave, S.V.**—“ You and Your Health”, G.Y. RanePrakashan, Poona, 1967
- 6) **Bunn, John W.** - Basketball Methods( N.P. Nelson Publisher, Philadelphia.)

- 7) **Caral Jean, West Suitar & Crowleys, Merrily Forbes** "Nutrition" ( J.B. Lippincott company, Philadelphia, 1984)
- 8) **Chatterjee, C.C.** (Text book H' physiology) medical Allied Agency Calcutta, Vol. I ed 2003
- 9) **Christensen, Alice.** "Yoga for Sports" (Contemporary book, Chicago, 2000)
- 10) **Cooper, John M.** "The theory and science of Basketball," (Lea & Febiger, Philadelphia, 1975)
- 11) **Deb. A.C.** "Harper's Fundamentals of Biochemistry", New Central Book Agency (p.) Ltd. Calcutta/ Kalkata, (8<sup>th</sup> ed.) 2006
- 12) **Gopalan, C., Rama Shastri B.V. & Balsubramanian, S.C.** "Nutritive value of Indian Food", (National Institute of Nutrition, Indian Council of Medical Research, Hydrabad, India)
- 13) **Grewal, A.,** "Hypothesis making & Testing abilities," National Psychological Corporation, Agra, 1988.
- 14) **Jagger, B.** "Basketball: Coaching and Playing" (London : Faler and Faver Ltd. 1971) Johnson
- 15) **Kansal Devinder K.,** "Test and Measurement in Sports and Physical Education.," (D.V.S. Publication, New Delhi, India),
- 16) **Mc Partlin, Mark G.A.,** "Fitness Sports." (G. Bell and Sons son Ltd. London 1975)
- 17) **Moontasir Abhas** "Principles of Basketball" SKANDA Publication, Bombay 1979
- 18) **Nieman, David C.** PHFACSM, "Fitness and Sport Medicine: A Health Related Approach", 3<sup>rd</sup> edition. (Mayfield Publishing Company Mountain View, California, London, Toronb, 1995)
- 19) **Philip, J. Rasch and Roger K Burke** " Kinesiology and Applied Anatomy" (Lea Febiger, 1978)
- 20) **Rishipal Sing-** "Basics of Basketball" (World vision publication, Gwalior, 2001
- 21) **Shaw, D. and Tomar, R.** " Doctoral Research in Physical Education & its Sciences in Developed Countries"
- 22) **Thani , Y. -** "Weight Training in Sport", Sports Publication, Delhi. 1997.
- 23) **Thibodeau, G.A. & Kevin, T. Patton-** "Structure and Functions of the body" Edward Murphy, Mosby year book- 1992.
- 24) **Uppal A. K.,** "Comparative Effects of Two Duration Load Methods and Interval Running Method on Cardio Respiratory Endurance and Selected Physiological Variables," (Unpublished Doctoral Thesis, Jiwaji University, 1988).
- 25) **Yadav, Y.P. And Mrs. Rachna,** "Art of Yoga" (Friend Publications, India).

\*\*\*\*\*