

## STUDY OF PHYSIOLOGICAL VARIABLES OF BASKETBALL PLAYERS AT DIFFERENT LEVELS OF COMPETITIONS

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### ABSTRACT

*The purpose of this study is to analysis the differences of physiological variables of basketball players at different levels of competitions. This study is a part of doctorate study having a title "Study of Physiological, Body Composition and Psychomotor variables of Basketball Players at different levels of Competitions". Study was conducted on 50 basketball male players (25 inter college and 25 under-19 School male basketball players) from. In This study physiological variables were taken (i. Vital Capacity (FVC, PIF & PEF) ii.  $Vo^2_{max}$ ). Results showed that there exists a significant difference between Inter College and Under-19 School Male Basketball Players among their Physiological variables. It showed that Vital Capacity and  $Vo2_{max}$ . is Higher in Inter College Basketball Male Players when statistically compared with Under-19 School basketball male players.*

*Key Words: Physiological Variables, Competition and Players.*

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### INTRODUCTION:

The developing tendencies in international sports, especially in team games are identified as the increase in game tempo, tougher body game and greater variability in technique and tactics. An increased performance level can only be achieved by working and training of all major components i.e. technique, coordination, tactics, physical fitness, physiological qualities and psychological qualities. Basketball is one of the most popular team based sports played and watched throughout the world. It is played by both males and females of all ages and fitness levels. It is a game played by two opposing teams on a court measuring 29 x 15 metres. The aim of the game is for each team to defend a goal area while trying to score baskets at the opposing end of the court. Each team consists of ten players of which only five may take the court at any one time during play. For

optimal performance during play at an elite level a variety of areas must be addressed. These include the high skill level, flexibility, muscular strength, speed, agility and importantly the specific use of different physiological, body composition and psychomotor variables.

Physiological exercise testing is important in basketball to help identify potential talent but also to provide the players, trainers and coaching staff with some profiles for the players and a measure for evaluating training programs. Testing physiological requirements for basketball has become more specific over the past decade with further advances in both sports science technology and general understanding of the physiological requirements for testing basketball. However despite this progress in testing procedures and knowledge there still appears limited research regarding the analysis and critical appraisal of tests used specifically for basketball. Many laboratory and field tests for physiological assessment do exist, however to be thorough in reviewing physiological status it is important to assess all components of the sport, specifically measuring each energy system. The other main component of the game not covered within this review is skill. These tasks can be assessed with testing procedures that exist but the coaching staff normally specializes in this area and thus generally will devise their own skill assessment. It is important also to note the musculoskeletal screening assessments involving information regarding the players muscle balance, core stability and general flexibility. This testing is normally done separate to the fitness based testing and is performed by physical educationists, trainers, physiotherapists, coaches and researchers. Together all of this information provides a perfect combination to ensure analysis of every physical component of the game.

#### OBJECTIVES:

To compare the physiological variables of school, college and university male basketball players.

#### I. PHYSIOLOGICAL VARIABLES

- a) Vital Capacity
  - i. FVC (Forced Expiratory Vital Capacity)
  - ii. PEF (Peak Expiratory Force)
  - iii. PIF (Peak Inspiratory Force)

b)  $VO_2$  max (Maximum Oxygen Consumption)

**HYPOTHESES:**

It is hypothesized that there will be significant difference between physiological variables of school and college male basketball players.

**SIGNIFICANCE OF THE STUDY:**

Results of the study may be helpful in the following ways:

1. The results of the study will add new dimensions of knowledge in the field of physical education and sports with special reference to basketball players.
2. The study will help to quantify the physiological status of basketball players.
3. The study also reveals the role played by crucial physiological variables basketball performance.
4. The result of study may be helpful for scanning of future potential basketball players on the basis of physiological variables.

**METHODOLOGY:**

For the purpose of the study 100 Basketball male players were selected as subjects (50 inter college and 50 under-19 school players). The subjects were thoroughly acquainted with the testing procedure as well as the purpose and significance of the study. A thorough orientation of requirements during the testing procedures and performance test were made for successful completion of study. Statistical analysis was made with the help of mean, standard deviation and 't'-test was applied.

**RESULTS:**

I. PHYSIOLOGICAL VARIABLES (UNDER-19 SCHOOL AND INTER COLLEGE BASKETBALL PLAYERS).

## i. VITAL CAPACITY

## a. FORCED VITAL CAPACITY

TABLE –1

MEAN AND STANDARD DEVIATION OF FORCED VITAL CAPACITY OF UNDER-19 SCHOOL AND INTER COLLEGE BASKETBALL PLAYERS

Group	Mean	Standard Deviation	Standard Error Mean	t-test
Under-19 School Basketball Players	2.8406	0.50464	0.07137	5.934
Inter College Basketball Players	3.4794	0.56995	0.0806	

Level of Significance .05

df=98

Table 't'-value at .05(1.980)

FIGURE –1

MEAN AND STANDARD DEVIATION OF SELECTED FORCED VITAL CAPACITY (FVC) VARIABLES OF UNDER-19 SCHOOL AND INTER COLLEGE BASKETBALL PLAYERS

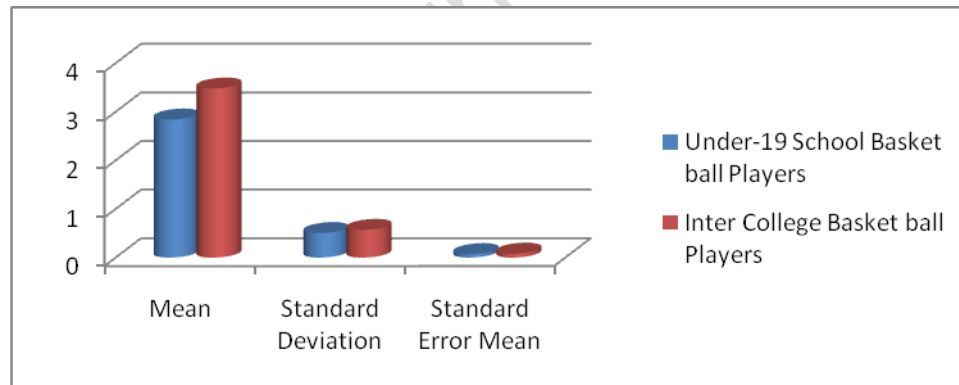


Table-1 shows that the mean and standard deviation values with regard to Under-19 School Basketball Players is 2.8406 and 0.50464 whereas in the case of inter college basketball players is 3.4794 and 0.56995 respectively. The calculated t-value (5.934) which is more than tabulated t-value (1.980) at .05 level. So, it indicates that there has been a significant difference between Under-19 School and Inter College Basketball Players for their FVC.

## b. PEAK EXPIRATORY FLOW

TABLE –2

MEAN AND STANDARD DEVIATION OF PEAK EXPIRATORY FLOW (PEF) OF UNDER-19 SCHOOL AND INTER COLLEGE BASKETBALL PLAYERS

Group	Mean	Standard Deviation	Standard Error Mean	t-test
Under-19 School Basketball Players	2.1508	0.49702	0.07029	9.004
Inter College Basketball Players	3.1164	0.57267	0.08099	

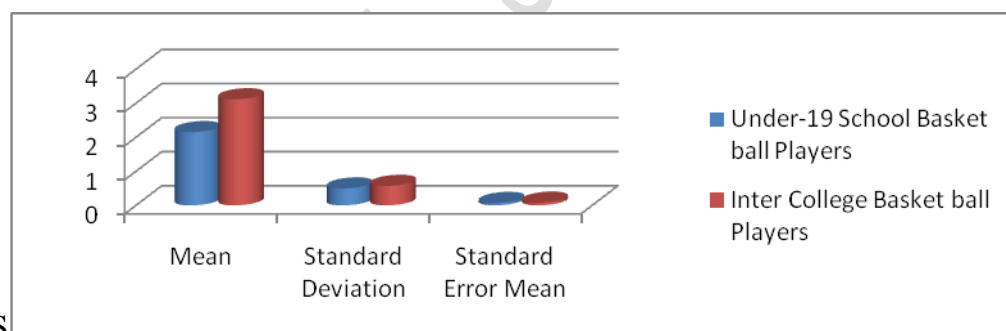
Level of Significance .05

df=98

Table 't'-value at .05(1.980)

FIGURE –2

MEAN AND STANDARD DEVIATION OF PEAK EXPIRATORY FLOW (PEF) OF UNDER-19 SCHOOL AND INTER COLLEGE BASKETBALL PLAYERS



PLAYERS

Table-2 shows that the mean and standard deviation values with regard to Under-19 School Basketball Players is 2.1508 and 0.49702 whereas in the case of inter college basketball players is 3.1164 and 0.57267 respectively. So it indicates that there has been a significant difference between under-19 school and inter college basketball players for their PEF. The calculated t-value (9.004) which is more than tabulated t-value (1.980) at .05 level.

## iii. PEAK INSPIRATORY FLOW

TABLE –3

MEAN AND STANDARD DEVIATION OF PEAK INSPIRATORY FLOW (PIF) OF UNDER-19 SCHOOL AND INTER COLLEGE BASKETBALL PLAYERS

Group	Mean	Standard Deviation	Standard Error Mean	t-test
Under-19 School Basketball Players	104.3	14.363	2.031	1.901
Inter College Basketball Players	111	20.357	2.879	

Level of Significance .05

df=98

Table 't'-value at .05(1.980)

FIGURE-3

MEAN AND STANDARD DEVIATION OF SELECTED PEAK INSPIRATORY FLOW VARIABLE OF UNDER-19 SCHOOL AND INTER COLLEGE BASKETBALL PLAYERS

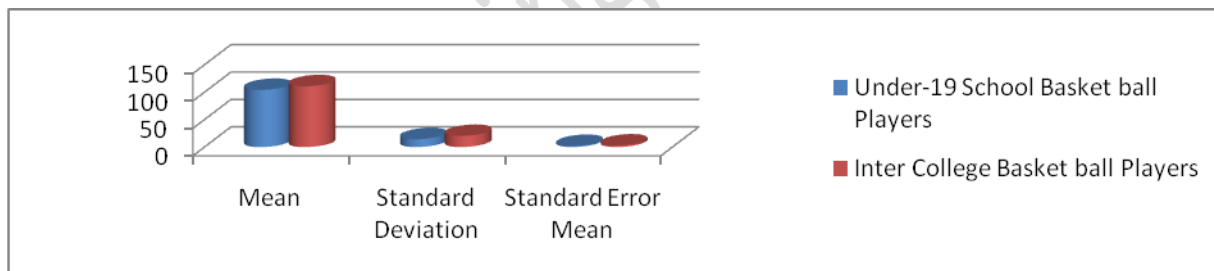


Table-3 shows that the mean and standard deviation values of Peak Inspiratory Flow with regard to Under-19 School Basketball Players is 104.3 and 14.363 whereas in the case of Inter College Basketball Players is 111 and 20.357 respectively. The calculated t-value (1.901) which is more than tabulated t-value (1.980) at .05 level. So, it indicates that there has been a significant difference between under-19 school and inter college basketball players.

ii. VO<sub>2</sub>MAX

TABLE-4

MEAN AND STANDARD DEVIATION OF SELECTED VO<sub>2</sub>MAX VARIABLE OF UNDER-19 SCHOOL AND INTER COLLEGE BASKETBALL PLAYERS

Group	Mean	Standard Deviation	Standard Error Mean	t-test
Under-19 School Basketball Players	35.75	5.625	0.796	10.743
Inter College Basketball Players	47.19	5.005	0.708	

Level of Significance .05

df=98

Table 't'-value at .05(1.980)

FIGURE-4

MEAN AND STANDARD DEVIATION OF SELECTED VO<sub>2</sub>MAX VARIABLE OF UNDER-19 SCHOOL AND INTER COLLEGE BASKETBALL PLAYERS

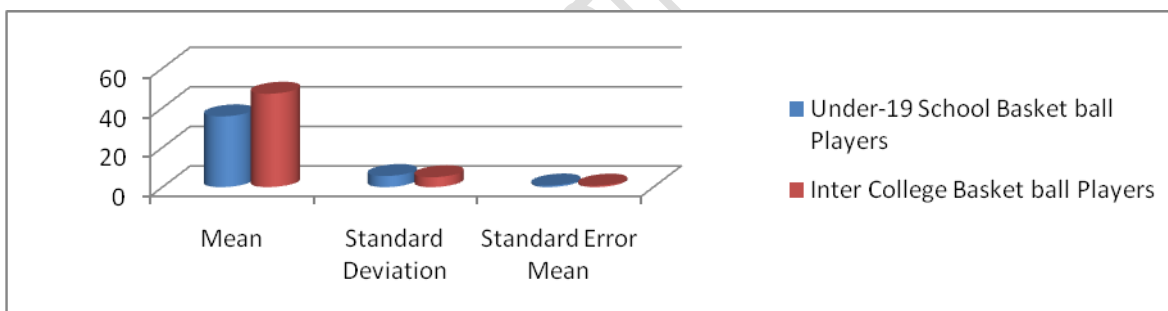


Table-4 shows that the mean and standard deviation values with regard to Under-19 School Basketball Players is 35.75 and 5.625 whereas in the case of Inter College Basketball Players was 47.19 and 5.005 respectively. The calculated t-value (10.743) which is more than tabulated t-value (1.980) at .05 level. So, it indicates that there is a significant difference between under-19 School and Inter College Basketball Players.

## DISCUSSION OF THE FINDINGS:

### Forced Vital Capacity (FVC):

The result of the study showed that there were differences between the two levels i.e., Under-19 School Inter and College Basketball Players for their Forced Vital Capacity (FVC). Previous study with the purpose to investigate the Effect of Chronic Exercise on Lung Function and Basal Metabolic Rate in some Nigerian Athletes (Obrefeyi A. Adegoke and O.Arogundade, 2002) showed there was difference between the two groups of Nigerian Athletes and Non-Athletes. So, the above result is in agreement with the study.

### Peak Expiratory Flow:

The result of the study showed that there were differences between the two levels i.e. Under-19 School and Inter College Basketball Players for their Peak Expiratory Flow. It was found that these two groups were statistically different when compared with each other. The study had been supported by the previous study of Comparison of Peak Flow Rate and Vital Capacity between District level and State level Baseball Players (Sukhdev Singh, Vishav Gaurav and Keshav Kholi, 2012).

### Peak Inspiratory Flow:

The result of the study showed that there were differences between the two levels i.e. Inter College and Under-19 School Basketball Players with regard to their Peak Inspiratory Flow. It was found that these two levels of groups were statistically different when compared with each other. The results established the fact that exercises and physical workout increases the level of vital capacity which makes the people fit and active. The investigation by Johnson (1999) indicates that among the many physiological adjustments during exercise, respiration is apparently changed during exercise compared to result and among different levels also.

### VO<sub>2</sub>max:

The results of the study showed that there were significant differences between the two levels for their VO<sub>2</sub>max. The present results were supported with the previous study of Surapan K. Dey, Nabanita Kar and Parthasarathi Debray, (2010).



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