

## A comparative study of physiological profile of Soccer trainee of different ages



### Physiology

**KEYWORDS :** Soccer, physiological profile, Systolic Blood Pressure & Diastolic Blood Pressure.

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### ABSTRACT

*The purpose of the study was to compare the physical parameters viz. height, weight, BMI, and physiological variables, i.e. blood pressure (systolic & diastolic both in resting condition).*

*A group of soccer players (training) comparing of 56 in number are being trained at a regular interval. 35 out of 56 players who voluntarily agreed to participate in this study have been included. They have been briefed about the study. Standard Statistical tools were used for generalized the fact. From the study it was revealed that the body height, weight, BMI, and physiological variables, i.e. blood pressure (systolic & diastolic both in resting condition) are more compare to the value of a national and international players.*

### INTRODUCTION

Top soccer players do not necessarily have an extraordinary capacity in any of the areas of physical performance. Soccer training is largely based on the game itself, and a common recruitment pattern from player to coach and manager reinforces this tradition. New developments in understanding adaptive processes to the circulatory system and endurance performance as well as nerve and muscle adaptations to training and performance have given rise to more effective training interventions. Endurance interval training using an intensity at 90-95% of maximal heart rate in 3- to 8-minute bouts have proved to be effective in the development of endurance, and for performance improvements in soccer play. Strength training using high loads, few repetitions and maximal mobilization of force in the concentric mode have proved to be effective in the development of strength and related parameters. The new developments in physical training have important implications for the success of soccer players.

A range of relevant physiological factors can be considered which are subject to strong genetic influences (e.g. stature and maximal oxygen intake) or are largely environmentally determined and susceptible to training effects. Consequently, fitness profiling can generate a useful database against which talented groups may be compared. No single method allows for a representative assessment of a player's physical capabilities for soccer. Therefore a study have been undertaken to highlight the physiological profile as part of a holistic monitoring of talented young players.

Soccer is the most popular sport in the world and is performed by men and women, children and adults with different levels of expertise. Soccer performance depends upon a myriad of factors such as technical/biomechanical, tactical, mental and physiological areas. One of the reasons that soccer is so popular worldwide is that players may not need to have an extraordinary capacity within any of these performance areas, but possess a reasonable level within all areas. However, there are trends towards more systematic training and selection influencing the anthropometric profiles of players who compete at the highest level. As with other activities, soccer is not a science, but science may help improve performance. Efforts to improve soccer performance often focus on technique and tactics at the expense of physical fitness. During a 90-minute game, elite-level players run about 10 km at an average intensity close to the anaerobic threshold (80-90% of maximal heart rate). Within this endurance context, numerous explosive bursts of activity are required, including jumping, kicking, tackling, turning, sprinting, changing pace, and sustaining forceful contractions to maintain balance and control of the ball against defensive pressure.

The positional role of a player is related to his or her physiological capacity. Thus, midfield players and full-backs have the highest maximal oxygen intakes ( $> 60 \text{ ml} \times \text{kg}^{-1} \times \text{min}^{-1}$ ) and

perform best in intermittent exercise tests. On the other hand, midfield players tend to have the lowest muscle strength soccer players don't cover a full marathon distance (42 kilometers) during a game, the alternating fast and slow running which they utilize can easily deplete their leg-muscle *glycogen* stores. For example, just six seconds of all-out sprinting can trim muscle glycogen by 15 per cent, and only 30 seconds of upscale running can reduce glycogen concentrations by 30 per cent! The high average intensity of soccer play (studies show that to-notch players spend over two-thirds of a typical match at 85 per cent of maximal heart rate) accelerates glycogen depletion. Plus, the time duration of a soccer match, 90 minutes, is more than enough to empty leg muscles of most of their glycogen. In fact, research has shown that soccer players sometimes deplete 90 per cent of their muscle glycogen during a match, more than enough to heighten fatigue and dramatically reduce running speeds.

### OBJECTIVES OF THE STUDY:

To study the physical parameters viz. height weight, BMI, and physiological variables, i.e. blood pressure (systolic & diastolic both in resting condition).

### METHODOLOGY

#### SELECTION OF SITES:-

After visiting 4 training club of soccer in different places of Kolkata, the author had selected and restricted the study nearer to Dankuni area in the district of Hooghly, West Bengal, India.

#### SELECTION OF SUBJECTS:-

A group of soccer players (training) comparing of 56 in number are being trained at a regular interval. 35 out of 56 players who voluntarily agreed to participate in this study have been included. They have been briefed about the study.

#### FIELD DATA COLLECTION:-

Following data have been collected in the relevant equipment.

1. Age:- The age of the subject was calculated from their date of birth and then their age in decimal fraction was calculated. It was also recorded from their record book of club register. It is expressed in kg.
2. Height:- Body height was measured by using anthropometric rod adopting standard procedure. It is expressed in cm.
3. Resting Heart Rate:- It is monitored by record the time taken for 30 beat. It is expressed in beats/min.
4. Maximum Heart Rate:- It is computed as  $...((220-\text{age})$ . It is expressed in beats/min.
5. Reserve Heart Rate:- It is computed as  $...(\text{Maximum Heart Rate} - \text{Resting Heart Rate})$ . It is expressed in beats/min.

#### 6. Nutritional Survey:-

To perform the diet survey Oral questionnaire method for three days was done then one days average food consumption was

calculated and from that the energy, carbohydrate, protein and fat content of the food is calculated and compared with the energy, carbohydrate, protein and fat requirement of the family. It is assumed that we get 70%, 10% and 20% energy from carbohydrate, protein and fat respectively.

**Statistical Analysis:-**

The parameter studied in the present investigation where subjected to statistical analysis under student t-test (two tail), mean, SD, etc.

**RESULT AND DISCUSSION**

Physical characteristics of the soccer players of three ages (17 year,18 year 19 year)having under study are summarize in table-1 A,B and C. It can be seen from the table the mean value of the body weight of all three ages were 59.46, 60.63, 61.49 respectively. The average heights of all three ages were 168.33, 168.68, and 169.6 respectively. Similarly the average body mass indexes (BMI) of all three ages were 21.30, 22.41, and 22.69 respectively. It is interesting to note as the age goes on increasing the value of all three parameters mention above were increasing. This may be due to the fact the subject under study are in the growth and developmental phase.

The value of BMI(Kg/M2) of all the ages varies from 21.30 to 22.69 (Kg/M2).This indicate the subject under study are neither undernourished or over nourished and this value according to WHO with a cut off mark of Asian it categorized as normal.

This table also shows that the average resting heart rate of the subject were 63.62,63.37,60.75 respectively along with the maximum heart rate and heart reserve of three ages are 203,202,201 and 139.3,138.65,140.2 respectively. The value of systolic and diastolic blood pressures of all ages that is 17,18,19 years are 119,117.23,118 and 74.45,76.84,78.44 respectively, indicating that none of the subject are hypertensive or hypotensive. So based on that value of the heart rate and blood pressures the cardiovascular status of the subjects can be consider to be normal.

**Table-1 A, B, C Physical characteristics of the soccer of three ages having under study**

**Table-1A**

Variable	17 YEAR			
	Mean	±SD	Range	
			Upper	Lower
Height(cm)	168.33	3.45	173.4	163.4
Weight(Kg)	59.46	2.05	62	56
BMI(Kg/M2)	21.30	0.56	22.3	20.6
Resting HR(beats/min)	63.62	4.99	72	56.29
HR max(beats/min)	203	--	203	203
HR Reserve(beats/min))	139.37	4.99	146.71	131
Systolic BP(mm of Hg)	119	4.81	130	112
Diastolic BP(mm of Hg)	74.45	±5.203	82	65

**Table1B**

Variable	18 YEAR			
	Mean	±SD	Range	
			Upper	Lower
Height(cm)	168.33	3.45	173.4	163.4
Weight(Kg)	59.46	2.05	62	56
BMI(Kg/M <sup>2</sup> )	22.41	0.78	22.1	20
Resting HR(beats/min)	63.37	5.27	72	58.26
HRmax(beats/min)	202	--	202	202
HR Reserve(beats/min)	138.65	5.29	144.84	130
Systolic BP(mmHg)	117.23	4.085	122	115
Diastolic BP(mmHg)	76.84	3.131	80	74

**Table-1C**

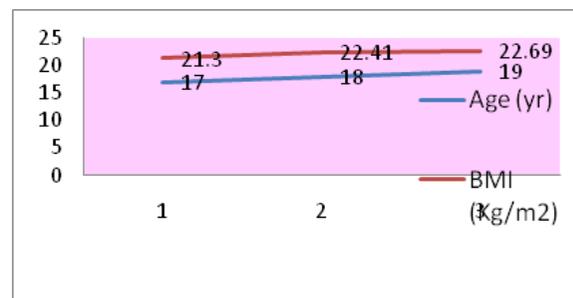
Variable	19 YEAR			
	Mean	SD	Range	
			Upper	Lower
Height(cm)	169.6	±3.85	174.6	162.9
Weight(Kg)	61.49	±2.85	63	59
BMI(Kg/M <sup>2</sup> )	22.69	±0.61	22.4	21.1
Resting HR(beats/min)	60.75	±60.75	125	112
HRmax(beats/min)	201	±0	201	201
HR Reserve (beats/min))	140.24	±5.55	149	132
Systolic BP(mmHg)	118	±4.34	125	112
Diastolic BP(mmHg)	78.44	±2.24	82	75

**Table 2: Average value of energy intake:-Amount of carbohydrate, fat and protein and their% contributing to total energy intake in the habitual diet of the soccer training under study**

Age	Energy Intake	Carbohydrate		Fat		Protein	
		gm	%	gm	%	gm	%
17	3952	526	53.2	142	32.4	142	14.4
18	3680	501	52.3	132	29.8	142	13.9
19	3742	542	64.83	141	16.86	153	18.30

Table-2 represents the average value carbohydrate, fat and protein and their % value contributing the energy intake in the habitual diet of the soccer trainee under study. From the table it can be shown that the caloric intake from the carbohydrate, fat and protein amounting to be 3952 Kcal/min,3680 Kcal/min and 3742 Kcal/min of the ages 17,18,19 years respectively. This table also shows that most of the energy comes from carbohydrate formed by fat and protein. In terms of % value they represent 64%,17% and 18% respectively. This data is very much consistent for the player of these ages of other study. The data of nutritional assessment also indicate the player are in the nutritional balance which is very much contrast with the value of BMI.

**Fig 1:- Comparison of mean of BMI of soccer trainee of different ages.**



**CONCLUSION**

The present study is under taken on a group of players (soccer trainee) having three different age group mainly 17, 18 and 19 years.

The physical profile of the subject under study can be categorized as though normal as per recommendation of WHO considering the value of BMI yet for athletes communities. The gross value of height, weight should have been proportionally more.

The body compositions of the subject in terms of percentage of fat and fat mass are more comparable to the value of national

and international players. According to the ICMR chart, the value of Nutritional status indicates a lower value than the expected. The national statuses of the player are not at all desired level and needs to be improved.

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