COMPARATIVE STUDY OF THE FOOTBALL PLAYERS AT DEFERENT PLAYING POSITION OF PUNJABI UNIVERSITY PATIALA: AN ANTHROPOMETRIC ANALYSIS

[1]Gurupreet Singh [2]Dr. Nishan Singh Deol

[1]Research Scholar, Dept. of Physical Education. Punjabi University
[2]Prof & Head Dept. of Physical Education, Punjabi University

ABSTRACT

The purpose of the study was to know about the comparative study of the football players at deferent playing position of Punjabi university Patiala: an anthropometric analysis. The study was conducted among 34 male football players (Inter College level) from Punjabi university Patiala presented. The subjects were thoroughly acquainted with the testing procedure as well as the purpose and significance of the study. A through orientation of requirements during the testing procedures and performance test were made for successful completion of study. They were asked to cooperate and to participate with utmost sincerity during the period of research. Subjects were made aware about the conduct of the study and relevant information was given by the researcher. Subjects were cooperative and participated whole heartedly in the present study. The variables selected for the study are anthropometric respectively. They are Height, Weight, Humerus bicondylar, Femur bicondylar, Biceps muscle girth, Calf muscle girth, Triceps skin fold, Calf skinfold, Subcapular skinfold, Supraspinale skinfold. Further the data were analyzed to find out the significant differences among the groups. 't'-test statistical technique was used to analyze the significant differences and the level of significance was set at 0.05 level for testing the hypothesis. Further the data were analyzed to find out the significant differences among the groups. The results revealed that there was no significant difference among the groups in Weight, Humerus bicondylar, Femur bicondylar, Biceps muscle girth, Calf muscle girth, Triceps skinfold, Subcapular skinfold, Supraspinale skinfold, and Calf skinfold. However there was significant difference between defender and midfielder in Height. Results clearly depicted that the Mesomorphic component has highest mean value among strikers.

Keywords: Football, Position, and Anthropometric.

INTRODUCTION:

"Football, which is also known as Soccer is probably world's most popular sports, played in practically every nation at varying levels of competence. Football may be played competitively or for fun, as a career, a means of keeping fit or simply a recreational pursuit. Soccer is the most popular sport in the world because it is performed by the man and women, children and adults with deferent level of expertise. The popularity of the game is reflected in the millions who participate in Soccer in lower level of play. Soccer is now being played in more than 210

countries throughout the world. Soccer is popular because of the fact it is a simple game requiring very minimum infrastructure and equipments. Stepnicka (1971)

Anthropometric measurement may differ between footballers of various playing positions for instance strikers, defender and mid fielder. Consequently, difference in the physical characteristics of football in different playing position within the teams is worth investigating.

defined sometotyping as "The combination of names, Health-Carter is justifiably as well known to those working on physique as is that of Hardy-Weinberg to those in population genetics." Massidda et al (2013) evaluated the study "Somatotype of elite Italian gymnasts." The somatotyping method is especially helpful in sports in which the body could directly influence the biomechanics of movements and the performance's results. The purpose of this study was to determine the somatotype of elite Italian gymnasts and to compare it in terms of competition levels. The sample comprised 64 elite gymnasts (42 females (F), somatotype 1.4-4.4-3.2; and 22 males (M), somatotype 1.6-6.3-2.1) belonging to the Italian National Artistic Gymnastic Team (2007) at different competition levels: Allieve, Junior, and Senior. Mean whole somatotypes, by competition levels, were not significantly different in both sexes (Female gymnasts: Allieve, 1.3-4.6-3.3; Junior, 1.3-4.2-3.6; Senior, 1.7-4.2-2.7; Male gymnasts: Junior, 1.5-6.3-2.5; Senior, 1.7-6.3-1.6). Male Junior gymnasts exhibited greater ectomorphy than Senior athletes ($F_{1,20} = 7.75$, $p < 0.01$). Compared to other elite athletes male and female gymnasts tend to be less endomorphic and more mesomorphic. This study highlighted the peculiarities of the somatotype of Italian elite gymnasts and their strong homogeneity, evident also from the low values of somatotype attitudinal mean (SAM). The results emphasize the need for a specific somatotype to reach an elite level in sport and the need to integrate the somatotype analysis between the scientific instruments for selecting talent also in artistic gymnastics. Martin et al (2013) evaluated the study "Anthropometric, body composition and somatotype characteristics of elite female volleyball players from the highest Spanish league." This study aimed to describe morphological characteristics of elite female volleyball players from the highest Spanish league, with special focus on differences by performance level and playing positions. Nearly all female players playing in the highest Spanish volleyball league during season 2003/2004 participated in this study (N=148 elite players, 92% of the total). Anthropometric, body composition and

somatotype parameters according to performance and playing positions were analysed. The players' characteristics were as follows; body mass 72.3±8.4 kg; stature 179.8±7.1 cm; body fat 24.0±3.1% and skeletal muscle mass 27.3±2.9 kg. Mean somatotype was 3.1±0.7; 3.4±0.9; 3.1±0.9 characterised as central with a tendency to balanced mesomorph. Top level players (whose teams were better classified in the team performance ranking) were taller, had higher skeletal muscle mass and ectomorphy, and had a lower level of adiposity markers, compared with lower level players. Players selected for their respective National teams (individual performance) were taller, heavier, had higher muscle mass and lower endomorphy than non-selected players. Differences according to playing positions were found. This study provides a complete set of reference data on anthropometry, body composition and somatotype of elite female volleyball players. Morphological differences have been identified according to performance level and playing position.

OBJECTIVES

- To find out whether the inter college level Football players playing in different positions differed in the selected anthropometric parameters.
- To evaluate somatotype differences in different categories of football players.

PROCEDURE AND METHODOLOGY

The study was conducted among 34 male football players (Inter College level) from Punjabi university Patiala presented. The subjects were thoroughly acquainted with the testing procedure as well as the purpose and significance of the study. A through orientation of requirements during the testing procedures and performance test were made for successful completion of study. They were asked to cooperate and to participate with utmost sincerity during the period of research. Subjects were made aware about the conduct of the study and relevant information was given by the researcher. Subjects were cooperative and participated whole heartedly in the present study.

TOOLS

Anthropometric Instrument

A number of instruments have been devised by anthropologists for taking accurate measurements on the living as well as on the skeleton. The use of proper equipment is most essential for anthropometric measurements. In the present study researcher will use the following instruments.

1. Weighing Machine
2. Anthropometeric Rod
3. Skinfold Caliper (Harpenden)
4. Sliding Caliper
5. Gullick Tape

Collection of Data

The field work for collection of data was conducted in the month of November 2013 from Punjabi university, Patiala. Subject, who were involved in the sports of football at interuniversity level were included in the study by the researcher.

1. Body weight:

Purpose: To measure the weight of the subject.

Instrument: Weighing machine. The instrument of choice for laboratory conditions in "person weighing machine" manufactured by M/S Avery Limited, India. The machine is calibrated with accuracy of 50 grams.

Procedure: The body weight is ideally taken on a standard weighing machine. The weight of all subjects was taken by removing all the clothes from the body except the shorts and shirts. The pointer of weighing machine was set at zero. The subject was said to stand bare footed on the weighing machine.

Scoring: Weight of the subject is measured in kilograms.

2. Height (Stature):

Purpose: To measure the Height of the subject.

Instrument: Anthropometric rod is the most used instrument for many of the anthropometric measurements on the living beings. It is used to take height measurements as well as transverse breadths of the body. It consists of four segments which when join together from a rigid bar of 200 cm. There is a fixed sleeve on the top of the rod and adjustable graduated cross bar passes through it. There is also movable sleeve with an adjustable graduated cross bar, which registers the height measurements.

Procedure: The vertex point is the highest point on the head when it is in a horizontal plane. For measuring height the subject was asked to stand bare footed and erect with both heels touching each other, with hips and upper scapular part touching the wall. The subject was asked to look straight so that his visual axis parallel to the surface of the floor. The anthropometric rod was held vertical in front of the body in mid-segital plane and the horizontal movable arm of the rod was brought down on to the vertex point. The height was recorded with the help of anthropometric rod.

Scoring: Height of the subject measured in centimeters.

3. Humerus Diameter:

It measures the straight distance between the two outermost points on the condyles of the lower end of humerus.

Instrument: Sliding caliper is used for taking shorter breadths. It consists of 25 cm. long straight bar. The arms are projected to an equal distance on both the sides of the scale. They end in sharp points on one side and have blunted ends on the opposite. The sharp ends are used for taking measurements on the skeletons whereas the blunt ends are used for measuring the living.

Usually, the caliper is graduated up to mm. calipers with venire have been devised for taking more accurate measurements. They also have adjustable arms which enable us to take projective measurements

Procedure: The subject was asked to raise his arm to the horizontal plane and bent at right angle. The measurement across the width of the lower end of the humerus was recorded by pressing the arms of the calipers.

Scoring: Humerus diameter is measured in centimeters.

4. Femur Diameter:

It is the straight distance between the outermost points of the condylies on the lower end of the femur.

Instrument: Sliding caliper

Procedure: The subject was asked to sit on the bench or chair with his knee flexed at right angle (90 □). The arms of the caliper were applied to compress the soft tissues of the epicondyles of the fumer.

Scoring: Femur diameter is measured in centimeters.

5. Calf Muscle Girth:

Purpose: To measure the circumference of the calf where calf muscle are most developed.

Instrument: Gullick tape is used to measure the girths of various parts of the body and skeleton. It is made of steel and is graduated in mm. width of the tape should be about 1 cm.

Procedure: The subject was asked to sit on a horizontal plane, preferably on flat stool, bending the knee at right angle and hanging the lower leg freely. The steel tape was applied around the calf muscles where these are most developed.

Scoring: Calf muscle girth is measured in centimeters.

6. Biceps Muscle Girth:

Purpose: To measures the circumference of the biceps where biceps muscles are most developed.

Instrument: Steel tape.

Procedure: the subject stand erect with their weight evenly distributed on both feet and legs slightly parted as well as right arm slightly sideward with open palm facing upward. The circumference measure was taken at the level of mid-point on the lateral (outer side) surface of the right arm, midway between midway between acromialecadiale. While recording, the tape was not too tight or too loose, it was lying flat on the skin, and with the tape horizontal.

Scoring: Biceps muscle girth is measured in centimeters.

Skinfold measurement:

Skinfold caliper: It is used for measuring the thickness of skinfold at various sites of the body. This measurement reflects the amount of sub-coetaneous fat. Harpenden (British) calipers are mainly used at present. The calliper pressure at the contact surface of the arms should be kept at 10 gm. /mm². Contact areas vary between 20 to 40 mm².

Procedure:

To predict the body fitness, measurement of subcutaneous fat is done by skinfold method with reasonable accuracy in field. Harpenden skinfold caliper is widely used for the measurement of skinfold thickness. Lange and common plastic caliper are also used for this purpose.

7. Triceps skinfold:

The triceps skinfold is measured on the back of the left upper arm over the triceps muscles.

Instrument: Skinfold caliper

Procedure: The subject was asked to stand erect hanging the arms freely by the side. Mid point was marked of the back of the upper arm of the subject over the triceps muscles. Picking up the skinfold about one centimeter above the marked point the jaws of the skinfold caliper were applied. The results were recorded after two seconds of applying pressure from the circular reading scale of the skinfold caliper in millimeter.

Scoring: Triceps skinfold measured in millimeter.

8. Calf skinfold:

Purpose: TO measures the circumference of the biceps where biceps muscle are most developed.

Instrument: Skinfold caliper

Procedure: The subject is asked to sit on a chair with the knee bent at right angle. The skinfold is picked up on the medial side of the right calf slightly above the level of the maximum girth. The fold should be parallel to the long axis of the leg.

Scoring: Calf skinfold is measured in millimeter.

9. Sub-scapular skinfold:

The sub-scapular skinfold is measured below the inferior angle of the scapula.

Instrument: Skinfold caliper

Procedure: The subject was asked to stand erect with arms hanging freely by the sides. The skinfold is raised beneath the inferior angle of right scapula. In the direction running obliquely downwards at the angle of 45 □ from the horizontal.

Scoring: Sub-scapular skinfold is measured in millimeters.

10. Suprailiac skinfold:

The suprailiac skinfold is measured about one centimeter above and two centimeter medial to the anterior superior iliac spine.

Instrument: Skinfold caliper

Procedure: The subject was told to stand erect, barefooted with heels together and arms hanging down freely by the sides. The fold is picked up for measurement immediately superior to the iliac crests at the mid-auxiliary line.

Scoring: Suprailiac skinfold is measured in millimeters.

STATISTICAL ANALYSIS

Table no. 1

Sr. no.	Component	Defenders		Midfielders		Strikers	
		mean	sd	Mean	Sd	Mean	Sd
1	Endomorphy	2.18	0.59	2.56	0.57	2.27	0.54
2	Mesomorphy	3.68	0.66	4.24	1.59	4.49	1.53
3	Ectomorphy	3.95	0.81	2.77	0.92	3.42	1.36

Mean and S.D. of all the groups i.e. Defenders, Midfielders and strikers with respect to their body type

From table 1 it can be seen that the mean value of the different body types of football players according to their position. It is depicted in the table that the mean value and SD of defenders for three somatotypic components is 2.18± 0.59, 3.68±0.66 and 3.95±0.81. Mean value and SD of midfielders is 2.56±0.57, 4.24±1.59 and 2.77±0.92. The mean value and SD of third group i.e. Strikers is 2.27±0.54, 4.49±1.53 and 3.42±1.36. It is clearly depicted from the results that Mesomorphic component has highest mean value among strikers i.e. 4.49±1.53.

Figure no.1

Mean and S.D. According to body type of deferent three groups of football players.

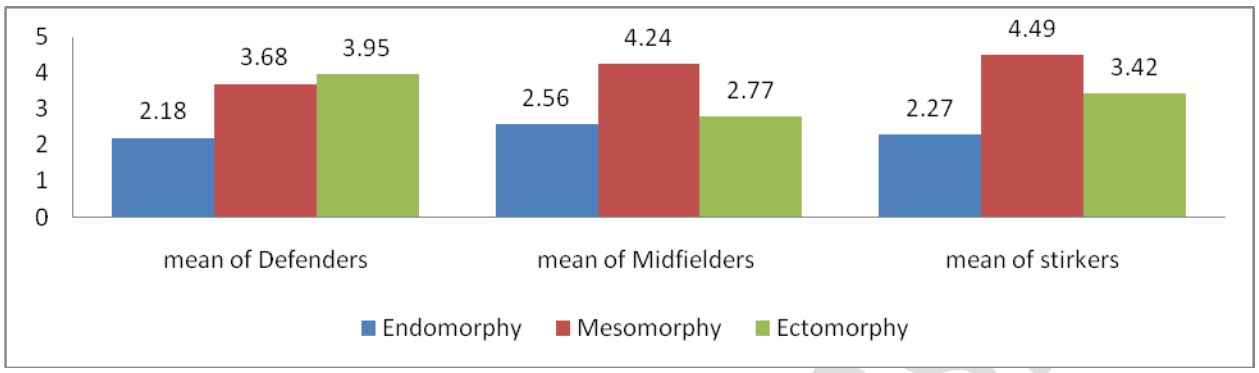


Table no. 2

Shows 't' value of defenders, midfielders and strikers football players

Sr. no.	Variables	't' test between Defender and midfielder (group1vs2)	't' test between Midfielder and attacker (group2vs3)	't' test between Defender and attacker (group1vs3)
1	Standing Height(cm)	2.65	0.80	1.40
2	Body weight(kg)	0.17	0.62	0.43
3	Humerus biepicondylar diameter (cm)	2.01	1.11	0.95
4	Femur biepicondylar diameter (cm)	0.56	0.05	0.91

5	Biceps muscle girth(cm)	0.58	0.80	0.50
6	Calf muscles girth(cm)	1.41	0.10	1.63
7	Triceps skinfold(mm)	1.75	1.62	0.25
8	Subscapuler skinfold(mm)	0	1.51	0.95
9	Supraspinale skinfold(mm)	0.26	0.66	0.80
10	Calf skinfold(mm)	1.29	1.79	0.81

Level of Significance .05

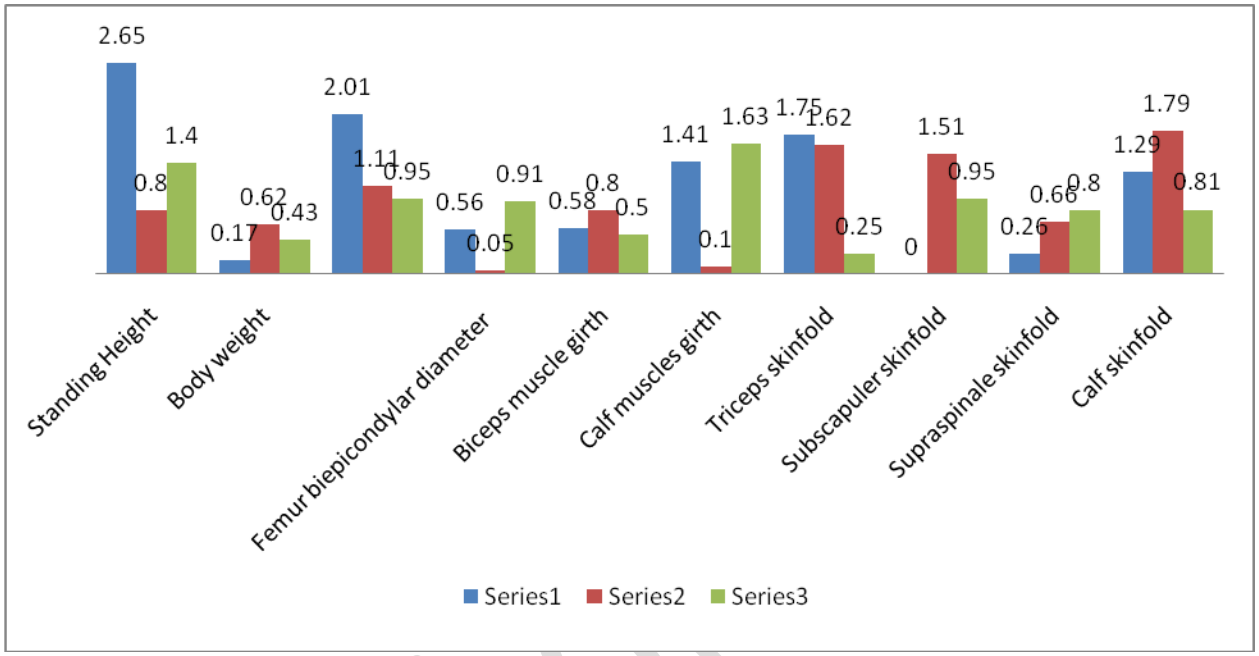
df=32

Tabulated 2.02

Table 2 shows the t-values between three groups i.e. defenders, midfielders and strikers. Level of significance was set at .05 at the degree of freedom 32 ‘t’-values shows significant value between defender and midfielder in height i.e. 2.65 which is more than the tabulated value (2.02). The other entire variable had a non significant.

. Figure no.2

Graphical representation of 't' value of Defenders, Midfielders and Strikers of football players



DISCUSSION & FINDING:

The main purpose of the study was to compare the body composition variables of football players at different position. The data collected from 34 Inter College football Players, is presented in this chapter. The data of all the three levels were calculated separately for all the ten anthropometric variables. The variables selected for the study are anthropometric respectively. They are Height, Weight, Humerus bicondylar, Femur bicondylar, Biceps muscle girth, Calf muscle girth, Triceps skinfold, Calf skinfold, Subcapular skinfold, Supraspinale skinfold. Further the data were analyzed to find out the significant differences among the groups. 't'test statistical technique was used to analyze the significant differences and the level of significance was set at 0.05 level for testing the hypothesis.

The results revealed that there was no significant difference among the groups in Weight , Humerus bicondylar, Femur bicondylar, Biceps muscle girth, Calf muscle girth, Triceps skinfold,

Subcapular skinfold, Supraspinale skinfold, and Calf skinfold. However there was significant difference between defender and midfielder in Height. Results clearly depicted that the Mesomorphic component has highest mean value among strikers

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