Chapter III

PROCEDURE

In this chapter selection of subjects, selection of variables, criterion measures, reliability of data, collection of data, description of tests. Design of the study and statistical procedure used for analysing the data are presented.

Selection of Subjects

Subjects for the study were ninety six football players who has participated in inter-university football tournament from different geographical conditions. Thirty two subjects were selected from Kerala (Coastal area), thirty two subjects were selected from Madhya Pradesh (Non coastal area) and thirty two subject were selected from Sikkim and Manipur (Hill area). The age level of subjects ranged from eighteen to twenty five years. All the subjects were residing at different geographical conditions.
Selection of Variables

The following physical, physiological, anthropometrical variables were selected for the purpose of this study.

Physical Variables

1. Speed
2. Endurance
3. Strength
   a. Leg Strength
   b. Abdominal Strength

Physiological Variables

1. Resting Heart Rate
2. Resting Blood Pressure
3. Vital Capacity
4. Respiratory Rate

Anthropometric Measurements

1. Height
2. Weight
3. Leg Length
4. Thigh Girth
Criterion Measures

The criterion measures chosen for testing the hypothesis were:

Playing Ability

The soccer playing ability of all players were judged (out of 10 points) by a pannel of three qualified experts during actual competition and the average of three score were considered as playing ability.

Physical Variables

1. Speed:- The time taken by individual to run the distance of fifty meters at which was recorded to the nearest 1/100 of a seconds.

2. Endurance:- Distance covered in Cooper's twelve minutes run/walk tests recorded to the nearest ten meter to assess the cardiovascular endurance of the subjects.

Physiological Variables

1. Resting Heart Rate:- Resting heart rate was recorded number of heart rate per minutes during the resting conditions.
2. Blood Pressure:- Blood pressure was measured in mm./Hg with sphygmomanometer and a stethoscope.

3. Vital Capacity:- Vital capacity was measured in liters, with the help of wet Spiro meter.

4. Respiratory Rate:- Respiratory rate was calculated number of breaths taken in a minutes.

Anthropometric Measurements

1. Weight:- Weight measures in kilogram by used a weighing machine.

2. Standing Height:- Standing height was recorded in centimeters with the help of wall scale.

3. Leg Length:- Leg length was recorded in centimeters.

4. Thigh Girth:- Thigh girth and calf girth were recorded in centimeteres.
Reliability of Data

The reliability of data was ensured by establishing the instrument reliability, tester's competency, reliability of test and the subjects reliability.

Instrument Reliability

Stopwatch, measuring tapes, Spiro meter, sphygmomanometer, stethoscope, weighing machine which were obtained from Standard Research Laboratories for the purpose of the study. All the instruments were well calibrated and thus accepted as accurate enough for the purpose of this study.

Tester's Reliability and Reliability of Tests

To ensure that the investigator was well versed in the technique of conducting the tests, the investigator attended 3 days special class conducted by Dr. L.N. Sarkar, Lecturer, Lakshmibai National Institute of physical Education, Gwalior (supervisor of this study). All the measurements were taken by the investigator himself with assistance from his institution. Who were also well acquainted with the tests and the testing procedure.
Tester’s competency was evaluated together with the reliability of tests. Reliability of tests was established by test, re-test method. Where by consistency of results was obtained by Product Moment Correlation. The data was collected from fifteen subjects, who were selected randomly and coefficient of correlation was computed for each variable. The obtained values have been presented in the Table 1. The very high value of correlation range from .87 to .97 established the investigator's competency to administer the test, as well as the reliability of the tests.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient of Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
<td>0.89</td>
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<tr>
<td>Endurance</td>
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</tr>
<tr>
<td>Leg Strength</td>
<td>0.93</td>
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<tr>
<td>Abdominal Strength</td>
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</tr>
<tr>
<td>Resting Heart Rate</td>
<td>0.95</td>
</tr>
<tr>
<td>Resting Blood Pressure</td>
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</tr>
<tr>
<td>Vital Capacity</td>
<td>0.96</td>
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<tr>
<td>Respiratory Rate</td>
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<tr>
<td>Height</td>
<td>0.97</td>
</tr>
<tr>
<td>Weight</td>
<td>0.94</td>
</tr>
<tr>
<td>Leg Length</td>
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<tr>
<td>Thigh Girth</td>
<td>0.93</td>
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<tr>
<td>Calf Girth</td>
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</tbody>
</table>
From the test, re-test coefficients of correlation (Table 1) it is obvious that the tester reliability was significantly high establishing the competency of the scholar to administer the tests. The coefficients of correlation also indicated the reliability of the tests selected, as very high correlations were obtained when the tests were repeated.

The above test, re-test coefficient of correlation also determined that subject reliability was adequate as the same subjects were used under similar conditions by the same tester and neither motivational technique were used nor was any training given.

Collection of Data

All the test were administered to the various university soccer players participated in All India Inter-university Football Tournament held at Chandigarh belonging coastal area, non coastal area and hill area.

Before the administration of tests the scholar personally met the team managers of concerned teams and took permission to collect data from their respective teams. After taking permission the scholar visited all the team members and elaborated each test items.
All the subjects were tested after their matches. The playing ability was assessed during their actual game situation by the three fully qualified experts.

In order to ensure the graphical condition in which the subjects residing, the scholar personally met all the subject asked them which area belongs to.

Test Administration

Physical Variables

Speed:

50 mtr. Dash

Procedure - Two subject ran at a time. Both of them took starting position behind the starting line. The start was given by sounding the clapper using the command "on your mark" "set" followed by clapping. The time of each subject was recorded by the time keepers who had been stationed at the finishing line.

Score - The period of time taken between the starters signal and the instant the subject crossed the finishing line was recorded to nearest one hundred of a second as the score of the subject.
Endurance:

Twelve Minutes Run/Walk

**Procedure :-** The test conducted on the standard 400 mts. track. The track was marked in ten meters segments. The subject started in group of sixteen. A lap scorer was assigned for each subjects. A starting signal by sounding a clap board was given and simultaneously a stop watch was started by the time keeper. The timer keeper blow a whistle at the end of the twelfth minute at which the subject stopped in their places. The lap scorers noted down the distance covered by each subject to the nearest ten meters.

**Score:**- The maximum distance covered by each subject in Cooper's twelve minutes run/walk test was recorded to the nearest ten meters as the cardiovascular endurance score.

**Strength**

Leg Strength:

Standing Broad Jump

**Procedure :-** Leg strength was measured with standing broad jump. The subject stood behind the take off line with feet parallel to each other. The performer flexed his knee and took his arm backward then with a vigorous forward swing of arm and extension of flexed
knee he took off and jumped forward as far as possible and landed on both the feet. The measurement was taken in centimeters between the takeoff line and the nearest mark made by heel or any other part of the body.

**Abdominal Strength**

**Procedure:** Abdominal strength was measured by using bent knee sit-ups. From a supine lying position the subject flexed his knees over the yard stick while sliding his heels as close to his seat as possible. The yard stick was held tightly under the knees until the subject was instructed to slowly slide his feet forward. At the point where the yard stick dropped on the floor, the tester marked the heel and seat line in order to indicate how far the seat should remain from the heel during the bent knee, sit-up test. The fingers of the subject was inter-laced behind the neck and performed the sit-ups, elbow touching the knees at the completion of the sit-up.

**Score:** The total member of sit-ups was recorded in one minutes as score of the subject. The incomplete sit-ups performed by the subjects were not recorded.
Physiological Variables

Resting Heart Rate:

Procedure:- The purpose of the test was to measure the number heart beats of the subjects in a minute.

Heart rate was obtained in early morning. The scholar approached the subject early in the morning and used a calibrated stopwatch and a stethoscope for counting heart rate. Subject were requested not to leave their bed.

Scoring - Total number of heart beats per minute for each subject was recorded as his score.

Blood Pressure

The purpose of the test was to measure the blood pressure (systolic and diastolic) of the subject.

Procedure - A sphygmomanometer (dial type) and a stethoscope were used to measure the blood pressure (systolic and diastolic) of the subjects. Each subject was asked to sit relaxed in a chair. It was taken on all subjects early in the morning. The cuff of the sphygmomanometer was wrapped around the left upper arm for the subject first above the elbow. The cuff was then connected to the pump and the manometer. After closing the outlet value of the
pressure pump the pressure in the inflatable rubber bag was rapidly raised to 180 mmHg by pumping air which was sufficiency to obliterate completely the bronchial artery. So that the flow of blood through the artery was arrested and radial pulse disappeared. The sound of pulsation was monitored by keeping the "chest piece" of the stethoscope over the bronchial artery and listening to the sound through the ear piece of the stethoscope as the pressure over the artery was being manipulated. The pressure was then gradually lowered by opening the valve.

As soon as the pressure in the cuff fell first below the systolic pressure, it allowed the passage of small amount of blood through the compressed artery into the distal segment. This produced clear tapping and sound and the pressure shown on the dial was noted as soon as this sound was heard. This denoted the measure of systolic blood pressure as the cuff pressure was lowered still further more blood flowed through due to rebond relaxation of the arterial vessel and this was indicated by a lauder sound. The pressure at which sound could be muffled by manipulating the pressure pump was read on the manometer scale. This denoted the measure of diastolic blood
pressure. These measurement were repeated twice for each subject and better one was recorded as his scores in these variables.

**Scoring** - The better reading was recorded in mm.Hg. as the subjects scores in systolic and diastolic blood pressure.

**Vital Capacity:**

**Procedure:**- Vital capacity was measured with the help of wet Spiro meter. It was ensured that the pointer of the scale was at the zero mark at the beginning of the test. The subject took a deep breath before starting the test and then after the fullest inhalation the subject placed the mouth piece attached to the hose connected to the air escaped through the edges of the mouth piece.

The subject exhaled slowly and steadily while slightly bending forward until the maximum volume of air could be expelled without taking a second breath. The subject were instructed that they should blow out only through the mouth not by the nose even partially. The nose of the each subject was dipped by the nose clip to prevent the air from escaping through the nose. The score of vital capacity for each subject was recorded in liters.
Respiratory Rate:

Procedure:- The subject were asked to rest in supine lying position on the mat. The respiratory rate was felt by placing the hand just below the thoracic cavity. The total number of exhalation or inhalation per minute was recorded for each subject.

Anthropometric Measurements

Height:

Procedure:- The height of the subjects were measured with subject standing erect without shoes against a wall marked scale. The subject were instructed to keep the heels together body touching the wall with heels, buttocks and back, head erect without tilt and to take and hold a full breath and standing erect while height measurement was taken. A stiff hard board was held horizontally on his head, slightly pressing the head and touching the scale marked on the wall, at right angle. The subject was asked to step out by lowering the head and the reading indicated by the lower end of the hard board was taken. Height was recorded to the nearest half centimeter.

Weight

Procedure:- Weight of the subject was taken with the help of a standard and calibrated weighing machine, in kilograms. Subjects
were asked to come on the weighing machine with short pants. They were asked to stand still keeping the body erect. The scores were recorded to the nearest kilograms.

**Leg Length:**

**Procedure:** Leg length of the subject was measured with flexible steel tape from the bottom out side edge of the center of foot to the upper edge of the greater trochanter and was recorded to the nearest half a centimeter.

**Calf Girth:**

**Procedure:** Calf girth was taken with a flexible steel tape at the maximum circumference of calf in a plane at right angle to its long axis. The leg was held hanging over the table top so that tape measure were in horizontal plane in this position the calf muscle is quite relaxed. The measurement was taken to the nearest centimetres.

**Thigh Girth:**

**Procedure:** Thigh girth was measured with a steel tape placed around the thigh horizontally with its top edge under the fold of the buttocks. The subject were asked to stand with his weight equally distributed on both feet. A cross handed technique was used to raise
the tape to this level on the inner thigh. It was recorded to the nearest half centimetres.

**Design of the Study**

The design of the study was static group comparison design was used to assessed the status of physical, physiological anthropometric variables and playing ability in different geographical conditions.

**Statistical Techniques Employed for Analysis**

To compare physical, physiological, anthropometric variables and playing ability of soccer players in different geographical conditions, the one way analysis of variance was used.

To find out the relationship between physical, physiological and anthropometric variables with playing ability, the Pearson's Product Moment Correlation (zero order) was used. The significance was kept at .05 level.