Chapter - III

PROCEDURE

In this chapter selection of the subjects, methods employed, criterion measure, collection of data and statistical procedure for analyzing the data v presented.

Selection of the Subjects

For the purpose of the study, 400 players and non players from various schools\(^1\) of Dahod District school boys of age 15 to 17 years were selected randomly.

Selection of variables

After reviewing the literature and the discussion with the supervisor, Experts and research scholar selected following variables for the study:

1. Body Composition (Body Mass Index)
2. Coordination
3. Abdominal Strength
4. Speed
5. Explosive strength
6. Upper Body Strength

\(^1\) Appendix D
7. Flexibility

**Selection of Tests**

For the variables, the following tests were administrated to collect the data:

1. Body Composition : BMI - As per formula  
2. Coordination : Stick test  
3. Abdominal Strength : Sit Ups  
4. Speed : 50 yard run  
5. Explosive strength : Standing Broad Jump  
6. Upper Body Strength : Sitting Push Back  
7. Flexibility : Sit and Reach

**Criterion Measures**

After reviewing the available literature, the following standardized tests were selected and used to collect the relevant data on the selected dependent variables and they are presented in table 1.
TABLE 1

Variable and Their Measure

<table>
<thead>
<tr>
<th>Variable</th>
<th>Test/Method/Instrument</th>
<th>Unit of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Composition</td>
<td>BMI</td>
<td>Kg/cm²</td>
</tr>
<tr>
<td>Coordination</td>
<td>Stick test</td>
<td>Points score as per manual</td>
</tr>
<tr>
<td>Abdominal Strength</td>
<td>Sit Up</td>
<td>Number</td>
</tr>
<tr>
<td>Explosive Strength</td>
<td>Standing Broad Jump</td>
<td>Feet &amp; Inches</td>
</tr>
<tr>
<td>Speed</td>
<td>50 yard Run</td>
<td>Seconds</td>
</tr>
<tr>
<td>Upper Body Strength</td>
<td>Sitting Push Back</td>
<td>Number</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Sit and reach</td>
<td>Inches</td>
</tr>
</tbody>
</table>

Reliability of the Equipment

The equipment taken in use for this study like, Measure tape, chalk, measuring board and duster were procured from the registered standards equipments suppliers and were procured with the guidance of the guide.
Collection of Data

The data on selected variables collected from the 30 schools in tribal area of Dahod district. Total 200 players who have participated in any level of games/sports and 200 non players were administrated test after the permission from respective principals for schools. The subjects were oriented with the study and the test.

Administration of Tests

For the testing of the hypothesis, the selected standards measurements were as follows.

1. **Body Mass Index**

   Objective: To Measure Body Composition.

   Equipment: Scales and Stadiometer as for Weight and Height.

   Method: BMI is calculated from body mass (M) and height (H). \( \text{BMI} = \frac{M}{H \times H} \), where M = body mass in kilograms and H = height in meters.

   Score: Use the table to determine your BMI rating. The table shows the World Health
Organization Body Mass Index classification system.²

2. **Stick Test of Coordination**

**Objective:** To measure Hand-Eye Coordination.

**Equipments:** Three sticks of same measure and weight for example wand used in Calisthenics.

**Method:**

**One-Half Flip:** The Subject holds two sticks in each hand. The third stick is to be balanced on these two sticks. The subject will then toss the balanced stick in air in such a way that the stick will circle 180° degree in air. The stick is then to be balanced again on the two and have to return at the starting position.

**Full Flip:** The Subject hold two sticks in each hand. The third stick is to be balanced on these two sticks. The subject will then toss the balanced stick in air in such a way that the stick will circle 360° degree in air. The stick is then to

²http://www.topendsports.com/testing/tests/BMI.htm
be balanced again on the two and have to return at the starting position.

Score: 5 trials were given to the subject and for each one time successful try the subject was awarded one point.\(^3\)

3. **Sit-Ups**

**Objective:** The Sit Up test measures abdominal muscular strength and endurance of the abdominals and hip-flexors, important in back support and core stability.

** Equipments:** Flat, Clean, Cushioned Surface, Stopwatch, Recording Sheets and Pen.

**Method:** The subject lies on a carpeted or cushioned floor with knees bent at approximately right angles, with feet flat on the ground. Subject’s hands should be resting on his thighs. Squeeze stomach, push back flat and raise high enough for the hands to slide along your thighs to touch the tops of the knees. Don't

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pull with neck or head and keep lower back on the floor. Then return to the starting position.

Score: The completion of one complete sit up (up and back) counts as one. The sit up performed correctly for one minute was counted.⁴

4. **Standing Broad Jump**

Objective: To measure the explosive power of the legs.

Equipments: Tape measure to measure distance jumped, non-slip floor for takeoff, and soft landing area preferred.

Method: The subject stands behind a line marked on the ground with feet slightly apart. A two foot take-off and landing is used, with swinging of the arms and bending of the knees to provide forward drive. The subject attempts to jump as far as possible, landing

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⁴Ibid, pp 38 - 40.
on both feet without falling backwards. Subjects will be given 3 trials for this.

Score: The measurement was taken from take-off line to the nearest point of contact on the landing (back of the heels). The longest distance jumped, the best of three attempts was recorded.\(^5\)

5. **50 Yard Run**

Objective: The aim of this test is to determine acceleration and speed.

Equipments: Measuring tape or marked track, stopwatch, cone markers, flat and clear surface of at least 70 meters.

Method: Start from a stationary standing position (hands cannot touch the ground), with one foot in front of the other. The front foot must be behind the starting line. Once the subject is ready and motionless, the starter will give the instructions "set" then "go." The participant

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\(^5\)ibid, pp. 55 - 57.
should be encouraged to not slow down before crossing the finish line.

Score: Two trials were allowed, and the best time is recorded to the nearest 2 decimal places. The timing starts from the first movement (if using a stopwatch).²

6. **Sitting Push-Back**

Objective: This test measures upper body strength and endurance.

Equipments: Horizontal overhead bar, at an adequate height so that the participants can hang from with arms fully extended and feet not touching the floor.

Method: The Subject will sit on feet and hands touching ground. Then, the subject will slowly put his right leg back side than left leg. Then, subject will look up side and will bend down towards ground. This exercise is to be done in correct way in one minute.

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Score: The score of correct way done push back in one minute was counted.\(^7\)

7. **Sit and Reach**

Objective: To measure Flexibility Strength of subject.

Equipments: Sit and Reach box or alternatively a ruler can be used, and a step or box.

Method: This test involves sitting on the floor with legs stretched out straight ahead. Shoes should be removed. The soles of the feet were placed flat against the box. Both knees should be locked and pressed flat to the floor - the subject may be assisted by holding their knees down. With the palms facing downwards, and the hands on top of each other or side by side, the subject tried to reach forward along the measuring line as far as possible. The hands should remain at the same level, not one reaching further forward than the other. The subject reaches out and holds that position for at one-two seconds

\(^7\)Ibid, pp. 46 - 47.
while the distance is recorded. No jerky movements were allowed.

Score: Recorded in Inches and the score of best of the 3 trials was counted.\(^8\)

**Statistical Procedure**

To compare Body Mass Index, Coordination, Muscular Strength, Speed, Explosive Strength, Flexibility and Agility scores of Players and Non-Players of tribal school children’s test was applied.

\(^8\)Ibid, pp. 35 - 37.