CHAPTER III
METODOLOGY

If we glimpse at the present scenario, we will realize that physical education field is going through a radical transformation. The efficiency of talented football players would be accurately judge by developed norms so that the trap of dirty sports politics can be avoided. The Present study was undertaken with a view to develop norms for selection of football team.

3.1 Research Design

The accuracy in results and quality of research findings depend mainly upon the research design. Research methodologists like Edwards (1968), Winer (1971), Kerlinger (1978) and many others considered research design as a controlled mechanism ruled by the principle of "Max Con Min." The 'max' explains the investigator to go for 'maximisation of systematic variance', whereas the 'con' explains to exercise the control over unwanted variables and 'min' gives an understanding to minimize error variables so as to ensure disciplined data that contribute to a sound generalizations. While verifying research objectives, a properly designed research tells
what to do and what not and indicates the steps to be taken in sequential manner for collecting the empirical data.

Present investigation is an associational predictive study that considers the principles of basic research. To develop norms for selection of football team of 12 to 14 years boys have been established.

3.2 Type of Research

For the present study Normative study under the descriptive research\(^1\) will be used. This study develops the norms of selected fitness factor and football skill of football players of Pune city zone.

3.3 Population and Sample

3.3.1 Population

In the present study, Pune city zone school boys of the age group of 12 to 14 year’s, those who are playing football in school team is the major characteristics or interest of the researcher.

3.3.2 Sampling

42 schools from the Pune city zone plays interschool football tournament organised by Poona school athletics association and Zilla Krida Parishad Pune are taken as the sample for this study. This ensures that 100% population is
covered in this study. Each team carries 16 members and total number of schools are 42 so the total number of the sample is \( n = 672 \) six hundred seventy two were selected for the study.

### 3.4 Sources of Data

The data were collected on 672 subjects by administering the selected Football skill tests, Physical Fitness tests, Height and Weight.

According to the weekly timetable of the sample school, the schedule of data collection was planned in such a way so that it did not disturb the day to day routine work of the school. For smooth data collection, the investigator has chalked out either the evening sports practice session or morning physical education and fitness program session for three days in a week for each school.

Thus, the researcher could cover two schools in one week for complete data collection. Considering this schedule of data collection the investigator preplanned an 12-week schedule for the total 42 sample schools. Data collection was started from July to September 2008 after getting permission from the Principals of the selected Schools. However, the schedules of the data collection have been presented below:
• A date-wise planning for data collection was prepared for each school separately and issued to school authorities well in advance so that selected subjects could participate in all events of the testing programme.

• Administration of test is divided into two sessions: morning 7:15 a.m. to 9:30 a.m. and evening 4:15 p.m. to 6:00 p.m.

• The day-wise programme for data collection was mostly same for every school. Prior to the date of actual data collection, the subjects were informed to come with proper dress for exercise. In the next morning 7:15 a.m., the subjects were assembled, where proper introduction about testing programmed was given with a view to get systematic cooperation maximally from the subjects during data collections.

• From 7:30 a.m. to 8:10 a.m., the subjects were instructed to go for height and body weight.

• After completion of height and body weight, the subjects were told to go for warm-up.

• After finishing their warm-up, the subjects were directed to approach the technical assistants for participating in each field events of Physical Fitness Test.

• Evening session also the subjects were assembled at 4:15
p.m. for introduction and participating in each event of Football skill test. The timings in details have been presented in Table 3.1.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>7.15 am to 7.30 am</td>
<td>Assembly and instruction</td>
</tr>
<tr>
<td>2.</td>
<td>7.30 am to 8.10 am</td>
<td>Height, Weight &amp; Warm-up</td>
</tr>
<tr>
<td>3.</td>
<td>8.10 am to 9.30 am</td>
<td>Physical fitness test</td>
</tr>
<tr>
<td>4.</td>
<td>4.15 pm to 4.30 pm</td>
<td>Assembly and instruction</td>
</tr>
<tr>
<td>5.</td>
<td>4.30 pm to 6.00 pm</td>
<td>Football skill test</td>
</tr>
</tbody>
</table>

3.5 Methods of Study

The purpose of present study was to develop norms for selection of 12 to 14 football players of Pune city zone. As this is normative study, the methodology adopted for the collection of data includes method of Research, selection of tests, procedure, description of tests, statistical tools that are described in this chapter.

The composition of selection criteria for formulating a
standard school level football team and it’s procedure of standardization including establishing reliable and valid norms have been completed by following stages.

- Identification of Dimension Representing selection criteria;
- Preparation of selection criteria (test-items) for each Dimensions;
- Administration of selection criteria on large sample;
- Item – Analysis and arrangement of items;
- Establishing norms;

   Based on the research review, test-items (variables) have been selected, standard instruments and appropriate procedure were used for testing the variable and accordingly data on each test-item were collected.

3.5.1 Major dimensions

- Dimension - A - Football Skill Test (30 meter running with ball, Kicking accuracy, Juggling).

- Dimension - B - Physical Fitness Test (Pull-ups, Bent-Knee Sit-ups, Standing Broad Jump, 12 Min. Run-Walk Shuttle Run (10 x 4 Mtr.), 50 Yard Dash).

- Dimension - E - Height and Weight to calculate BMI.

   After formulating the above items, the format of the whole ‘Selection Criteria’ was sent to various experts in the field of
Physical education and sports. Considering their judgment and on the basis of the investigator's professional experience, the component of test item were further modified and finally included. Presented in Table 3.2.

<table>
<thead>
<tr>
<th>Name Of dimensions</th>
<th>Name of test items</th>
<th>Elements tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Football Skill Test</td>
<td>30 meter running with ball</td>
<td>To assess the speed and control.</td>
</tr>
<tr>
<td></td>
<td>Kicking accuracy</td>
<td>Kicking efficiency.</td>
</tr>
<tr>
<td></td>
<td>Juggling</td>
<td>Balancing, Agility, Reaction ability and sense of touch of ball.</td>
</tr>
<tr>
<td>Physical Fitness Test</td>
<td>Pull-ups</td>
<td>Muscular Strength.</td>
</tr>
<tr>
<td></td>
<td>Bent-Knee Sit-ups</td>
<td>Muscular Strength (abs).</td>
</tr>
<tr>
<td></td>
<td>Standing Broad Jump</td>
<td>Explosive Strength of legs.</td>
</tr>
<tr>
<td></td>
<td>12 Min. Run-Walk</td>
<td>Cardio-vascular Endurance.</td>
</tr>
<tr>
<td></td>
<td>Shuttle Run (10 x 4)</td>
<td>Agility.</td>
</tr>
<tr>
<td></td>
<td>50 Yard Dash</td>
<td>Speed.</td>
</tr>
<tr>
<td>Height &amp; weight</td>
<td>Height (cm)</td>
<td>BMI</td>
</tr>
<tr>
<td></td>
<td>Weight (kg)</td>
<td></td>
</tr>
</tbody>
</table>

However, prior to finalize the above variable, the investigator considers the limitation of playground and equipment facilities.

The investigator was able to mark the ground well in advance prior to the schedule time of the test to ensure that the requisite facilities for administering the tests were available as
per the specific technical requirements. In the case of non-availability of running track, the investigator administered the test on a plane surface of the open field by accurate marking.

Appropriate score sheet were duly prepared for recording the scores of each test items separately. The researcher took special precautionary measures to administer the tests so as to facilitate smooth and systematic data collection. As the selection of the tools was appropriate, the technical assistants were professionally qualified and competent and the tests conducted bear sufficient standard, it was without doubt assumed that the data obtained were reliable.

3.6 Variables Measured

The present investigation delimited to the following variables only.

- Football Skill Test.
  a. 30 meter running with ball to assess the speed and control.
  b. Kicking accuracy for kicking efficiency.
  c. Juggling for Balancing, Agility, Reaction ability and sense of touch of ball.
- Physical Fitness variables.
  a. Cardiovascular endurance.
  b. Abdominal muscle strength.
c. Muscular Strength & Endurance,
d. Explosive Strength of legs.
e. Agility.
f. Speed.

- Height and Body Weight to find out BMI.

3.7 Criterion Measures and Tools Used

3.7.1 Football skill variable were measured as follow:

3.7.1.1 Speed and Control on ball was assessed with the help of 30 meter running with ball and score recorded is time measured from the interval of starting ‘go’ until both ball and the player reach to the finish line.

3.7.1.2 Kicking efficiency of Football players was assessed with the help of Kicking Accuracy test item and the score recorded is number of correct kicks into the designated parts of the goal post in a ten attempt trial.

3.7.1.3 Juggling test item is assess for to check the Balancing ability, agility, reaction ability and sense of touch of the ball and score recorded is the number of touches made by the subject continuously in his better performance out of the two attempts allowed to each subject.

3.7.2 Physical fitness variables were measured as follows:
3.7.2.1 Muscular Strength was assessed with the help of Pull-ups and the scores recorded is the maximum number of completed pull ups.

3.7.2.2 Abdominal muscle strength and endurance was measured with the help of Bent-Knee Sit-ups and the scores recorded is the number of correctly performed in 60 seconds.

3.7.2.3 Explosive Strength of legs was measured with the help of Standing broad jump and the scores recorded is the distance between the starting line and nearest point of landing.

3.7.2.4 Cardiovascular endurance was assessed with the help of field event i.e., 12-mins run-walk and the scores were recorded nearest to 0.5 meter.

3.7.2.5 Agility was assessed with the help of Shuttle run (4 X 10) and the score were recorded to the nearest 10<sup>th</sup> of a second.

3.7.2.6 Speed was assessed with the help of 50 yard dash and score were recorded correct up to 10<sup>th</sup> of a second.

3.7.3 Body weight was measured with the help of a weighing machine nearest to 0.5 kg., whereas standing body height was measured nearest to 0.5 cm. by using a vertical scale fixed with the wall.
3.8 Reliability of Data

With the help of Coefficient of Correlation analysis the reliability of data, subject and equipment were tested.

3.8.1 Tester reliability

There were four specially trained physical education lectures and eight M.Ed. (Physical Education) students helped in collecting the data. After the specialized training, all the assistants were asked to measure the performance of 15 subjects in the specified test, on trial basis, for which test would be allowed to collect data. The testers' reliability coefficients were determined statistically, which were ranged from 0.90 to 0.95. It is found that all the coefficients were statistically significant at 0.01 level. Therefore the final measurements taken with the help of these assistants was considered reliable and fully justified.

3.8.2 Subject reliability

The subjects reliability was established by 'test retest' coefficient of correlation of the scores obtained from the Physical fitness test and the Football Skill test. The gap between the test and retest was minimum 15 days. However, retest was completed upon 20% of the total target sample. By employing Pearson's product moment method, relationship
between the scores of the first and second measurements of the subjects in each test was determined.

Test-retest reliability coefficient of samples on the items of the Physical fitness test viz., Pull-ups, Bent-Knee Sit-ups, Standing Broad Jump, 12 Min. Run-Walk, Shuttle Run, 50 Yard Dash were recorded as 0.88, 0.96, 0.92, 0.93, 0.92 and 0.91 respectively. However, in the case of Football Skill test viz., 30 meter running with ball, Kicking accuracy, Juggling the reliability coefficient were recorded as 0.92, 0.94 and 0.84.

3.8.3 Score sheets

For recording the score of each items separately appropriate score sheets were duly prepared (shown in appendices I)

3.9 Description of Tests

3.9.1 Description of Foot ball Skill test

Football Skill test (SAI, 1992) was administered to measure the level of talent at young age.

This test comprises of three components, viz.,

- To assess the speed and control on the ball.
- To assess the Kicking efficiency.
- To assess the Balancing ability, agility, reaction ability and sense of touch of the ball.
The above components were measured by the following test-items:

- 30 Meter Running with the Ball test item is assess to check the speed and control while running with the ball.
- Kicking Accuracy test item is used for to check the Kicking efficiency of Football players.
- Juggling test item is assess for to check the Balancing ability, agility, reaction ability and sense of touch of the ball.

The description of each of the above test-items of has been presented below:

3.9.1.1 30 meter running with the ball (Pic.3.1)

**Purpose:** This test item is aimed to assess the speed and football control while running, of potential players.

**Equipment:** A stopwatch, footballs, measuring tape and marking powder.

**Test Administration:** Two straight lines, 30 meter apart, are marked on the field. The player is instructed to stand behind a marked line without touching the line, On the signal Ready? Go!, the timer start stopwatch and the player start running with the ball as fast as possible to reach the 30 meter finish line, by pushing the ball with leg control and by making a minimum of four inches with the ball at each touch including the first touch.
Time is measured from the interval of starting ‘Go’ until both ball and the player reach to the finish line.

**Scoring:** Each subject is given two attempts at an interval of 30 seconds and the best performance timing is recorded as score.

*Pic. 3.1*

30 Meter Running with Ball
3.9.1.2 Kicking Accuracy (Pic.3.2)

**Purpose:** This test item is aimed to assess the kicking efficiency of potential football players.

**Equipment:** A football goal post, inflated footballs, marking powder, a tape and two ropes.

**Test Administration:** The goalpost is divided into three equal parts by fixing two ropes as shown in (Pic. 3.2). A football is placed at the penalty mark. The players is given ten attempts 4 to kick the ball in left part, 4 to right part and 2 to the middle part of the goal in the following sequence – first two kicks into the right part followed by one kick in the middle part of the goal post to be followed by 2 kicks to the left part, and repeating the same pattern for the remaining five kicks. The ball is required to cross the goal line in the air to have the desired speed and strength in the kick.

**Scoring:** The number of correct kicks into the designated parts of the goal post in a ten attempt trial is recorded as score.
Pic. 3.2

SAI kicking accuracy test
3.9.1.3 Juggling (Pic.3.3)

**Purpose:** This test item is aimed to assess the balancing ability, agility, reaction ability and sense of touch of the ball.

**Equipment:** Three football.

**Test Administration:** The subject is instructed to keep the ball in the air by juggling continuously and is told that he may use any part of the body except hand while juggling (foot, thigh, chest, head). For starting the juggling, the subject is allowed to throw the ball in the air or to bounce the ball on the floor and start juggling till the subject is able to juggle the ball without dropping it on the ground.

**Scoring:** The number of touches made by the subject continuously in his better performance out of the two attempts allowed to each subject. The number of touches is recorded as score.
Pic. 3.3
Juggling
3.9.2 Description of Physical Fitness Test

AAHPER^2 Physical Fitness test was administered to measure the level of fitness.

This test comprises of six components, viz.

- Muscular Strength and Endurance of Arm and Shoulders;
- Muscular Strength and Endurance (abdominal);
- Explosive Strength of legs;
- Cardiovascular Endurance;
- Speed and Agility;
- Speed of lower extremities and Explosive strength.

The above components were measured by the following test-items:

- Pull - ups test is used for measure Muscular strength and Endurance of Arm and Shoulders.
- Bent Knee Sit Ups is used to measure strength of the abdominal muscles.
- Standing Broad Jump is used for to measure Explosive Strength of legs.
- 12 minutes run-walk test is used to measure Cardiovascular Endurance.
- Shuttle Run (10 x 4 m.) test is used for to measure Speed and Agility.
50 Yard Dash test is administrate to measure Explosive Strength of legs.

However, the description of each of the above test-items of Physical Fitness and Motor fitness has been presented below:

3.9.2.1 Pull - ups (Pic.3.4)

**Purpose:** This test measures the power of Arm and Shoulders Muscular strength and Endurance.

**Equipment:** A wooden or metal bar approximately 1.5 inches in diameter.

**Procedure:** The height of the bar should be such that when the subject hangs from it with fully extended arms, his feet do not touch the ground. The subject is asked to use an overhead grasp with the palms facing away from the body. From the hanging position, the pupil raises the body by the arms until the chin can be placed over the bar and then lowers the body to a full extension hang and repeats the pull ups as many times as possible. Only one chance is given unless it is obvious that the pupil has not had a fair chance. A neither swinging, nor kicking the legs nor knee rising is allowed.

**Scoring:** The maximum number of completed pull ups is the score.
Pic.3.4
Pull-ups
3.9.2.2) Bent – Knee Sit Ups (Pic.3.5)

**Purpose:** The bent - knee sit ups test is used to measure abdominal strength and endurance.

**Equipment:** Mats are recommended for safety comfort, stop watch and 6 x 6 sq. ft. area with sufficient floor space may be used.

**Procedure:** The starting position of the test is a back-lying position with knees flexed, feet on floor, and heels between 12 to 18 inches from the buttocks. The arms are crossed on the chest with the hands on opposite shoulders. A partner holds the examinee’s feet to keep them in contact with the testing surface. The examinee curls to a sitting position, maintaining arm contact with the chest. The chin should be tucked on the chest and should remain in this position until the completion of the sit up. When the elbows touch the thighs, the sit up is completed. The examinee curls back down on the floor until the mid-back contacts the testing surface. Another sit up may then be attempted. The examinee begins executing consecutive sit ups on the word “Go” using the signal “Ready, Go!” At the end of 60 seconds, the test is ended with the word “Stop”! The score is the numbers of sit ups executed correctly during this time. Pausing between sit-ups is permissible.
**Scoring:** The score is the numbers of sit ups executed correctly during 60 seconds. Incorrect execution includes failure to curl up, pulling the arms away from the chest, failure to touch the thighs with the elbows and failure to touch the mid back to the testing surface in the down position.

![Bent-Knee Sit ups](image)

**Pic.3.5**
Bent-Knee Sit ups
3.9.2.3 Standing Broad Jump (Pic.3.6)

**Purpose:** This test is measure the power of legs in jumping horizontal distance.

**Equipment:** Floor, mat or long jump pit may be used, measuring tape, marking powder/chalk.

**Procedure:** A demonstration of the standing broad jump is given to a group of subject to be tested. The subject is then asked to stand behind the starting line with the feet parallel to each other. He is instructed to jump as farthest as possible by bending knees and swinging arms to take off for the broad jumping the forward direction. The subject is given three trials.

**Scoring:** The distance between the starting line and the nearest point of landing provides the score of the test. The best (maximum distance) trial is used as the final score of the test.
Pic.3.6
Standing broad jump
3.9.2.4 12 Min. Run - Walk (Pic.3.7)

**Purpose:** The purpose of the 12 Min. Run Walk test is to measure maximal functional capacity and endurance of cardio respiratory system.

**Procedure:** Run and walk for 12 minutes has been administered for this purpose. Instruct the students to run as fast as possible, beginning on the signal “Ready, start”! As the student crosses the finish line, call out the elapsed time, which should be recorded by the student or the student’s partner. Walking, although permissible, should be discouraged since the purpose of the test is to measure maximal capacity.

**Equipment:** Stop watch, score cards, pencils, 400 Meter track or any other flat measured surface.

**Scoring:** The performance in distance covered by the subjects within 12 minutes is scored to the nearest 0.5 meters.
Pic.3.7
12 Min. Run-Walk
3.9.2.5) Shuttle Run (4 x 10 Mtr.) (Pic.3.8)

**Purpose:** This test is measure Speed and Agility.

**Equipment:** Two block of wood (2” x 2” x 4”), A stop watch and marking powder.

**Procedure:** Two parallel lines are marked on the floor 10 Mtr. apart or the width of the regular volley ball court may be used for the test. The two wooden blocks are placed behind the other line. On the signal ready? go, the timer starts the watch and the subject runs towards the blocks, picks – up one block, runs back to the starting line, places the block behind he starting line, runs back and picks-up the second block to be carried back across the starting line. As soon as the second block placed on the ground the timer stops the watch and record time.

**Scoring:** Two trials are allowed to each subject with some rest in between. The time of the better of the two trials is recorded to the nearest 10th of a second as the score of the test item.
Pic.3.8
Shuttle Run
3.9.2.6 50 Yard Dash (Pic.3.9)

**Purpose:** The purpose of this test is to measure Speed and Explosive strength of lower extremities.

**Equipment:** Stopwatch, marking powder.

**Procedure:** Two lines are marked on the floor 50 yards apart. One line is used as a starting line and other as the finish line. On the signal Ready? Go! The subjects start running at their best to reach the finish line at their earliest. The signal ‘go’ is accompanied with the downward sweep of the starter’s arm to give the visual signal to the timer who stands at the finish line.

**Scoring:** The interval between the starting signal and the instant subject crosses the finish line is the score of the test. The time is recorded correct up to 10th of a second.
Pic.3.9
50 Yard Dash
3.9.3 Description of Body Height and Body Weight.

3.9.3.1 Body Height\textsuperscript{3} (Pic.3.10)

**Purpose:** To measure the standing body height of the subjects.

**Facilities and Equipments:** Man power (one helper and one scorer), Wall perpendicular to a Flat Surface, Measuring tape and scale.

**Procedure:** Each subject, one by one, stands on the flat surface adjacent to the perpendicular wall where the measuring tape has been fixed. Subject stands without shoe or chapples in front of the wall (Fixed with Scale') contacting his heels, buttocks, and upper back and back of the head making firm contact with the scale. A foot scale was placed on the subjects head that firms right angles with the measuring wall tape. Keeping the scale at its position, the subject was instructed to come out of the wall and the score of height of each subject was recorded.

**Score:** The score was recorded in Cm least count to 0.1 cm.
Pic.3.10
Body Height
3.9.3.2) Body Weight (Pic. 3.11)

**Purpose:** To measure the body weight of subjects.

**Facilities and Equipment:** Manpower (one helper and one scorer), weighing Machine (Portable).

**Procedure:** Each subject, one by one, stands on the flat surface of the weighting machine, which was kept on a hard surface. Subjects were not allowed shoes and chapples while standing on the machine. They were then instructed to stand erect by keeping equal weights on both legs and by looking towards front direction. They were restricted to move body while standing on the machine. Keeping the machine at its position the investigator took the reading from the pointer associated with a scale indicating body weight.

**Score:** The score was recorded in kg.
Pic.3.11

Body Weight
3.10 Checklist of Equipment

Based on the nature of variables of Health-related Physical Fitness and Psychosocial factors, the investigator collected the associated equipments / instruments. However, these equipments / instruments were checked and their functional status has been verified accuracy in data collection. The checklist of the instruments has been presented in Table 3.3.

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Item</th>
<th>Quantity</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Stop Watches</td>
<td>10</td>
<td>Functional</td>
</tr>
<tr>
<td>02</td>
<td>Measuring Tape</td>
<td>02</td>
<td>Usable</td>
</tr>
<tr>
<td>03</td>
<td>Whistles</td>
<td>06</td>
<td>Functional</td>
</tr>
<tr>
<td>04</td>
<td>Pens</td>
<td>06</td>
<td>Usable</td>
</tr>
<tr>
<td>05</td>
<td>Pencils</td>
<td>20</td>
<td>Usable</td>
</tr>
<tr>
<td>06</td>
<td>Electronic Weighting Machine</td>
<td>01</td>
<td>Functional</td>
</tr>
<tr>
<td>07</td>
<td>Football</td>
<td>10</td>
<td>Usable</td>
</tr>
<tr>
<td>08</td>
<td>Rope</td>
<td>02</td>
<td>Usable</td>
</tr>
</tbody>
</table>

Table 3.3 Checklist of the Instruments

The investigator was able to form separate booth/ station for measuring body height, weight, pull-up, bent knee sit up,
standing broad jump, 12 minutes run and walk test, shuttle run, and 50 yard dash. 30 meter running with the ball, kicking accuracy and juggling test The availability of the requisite facilities for administrating the test as per the specific technical requirements was ensured before the schedule time. The investigator administered the 12 minutes run and walk test, 50 yard dash, shuttle run and 30 meter running with the ball on a plane surface in the open field by accurate marking of distance.
References


4. Ibid. p.166.


4 Ibid., p.166.